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PACIFIC DISCOVERY

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PRE-DISCOVERY

THREE GENTLEMEN of a certain printing firm we know, having strong feelings where the violation of our national park system is concerned, each wired the President last year to put on record his opposition to the damming of Dinosaur National Monument. All three, by a curious coincidence, have just received copies of a slick brochure entitled "Tomorrow s Playground for Millions of Americans," with a printed covering letter on the letterhead of "Utah Wildlife Federation," signed in facsimile by "D. Keith Barnes, President" of the Federation, and addressed to "Dear Friend of Conservation." Disregarding the obvious implication that the names and addresses of these three friends of conservation were channeled from Pennsylvania Avenue to Salt Lake City, or whatever is the actual point of origin of the brochure, there are far more sinister implications to be found in the brochure itself by anyone who reads it dispassionately and is able to weigh it against some of the literature being circulated by, for instance, the Sierra Club or any *genuine* conservation outfit. We have not space here to go into the thing point by point. All whose convictions about Dinosaur as a crucial battleground in the war for our parks are firm, will only be so angered by this bald attempt at subornation that they will forthwith become even more dedicated crusaders against the rape of our superlative natural areas. The tragedy is, many who are but tentative in their allegiance might easily be taken by this contrived counterattack, not having the ammunition to break it up with. As we said, this is slick — in its make-up, its insinuations, its "sell"; slick — you know the road signs warning "slippery when wet" — in its cover-up wording, omissions and distortions, its devices to beguile you away from the places where it is most patently "all wet." Item: it emphasizes the idea that few people have seen Dinosaur because of its inaccessibility and because its "wild," "treacherous" rivers are so dangerous to any but "daring boatmen" with "special skills." Well, of the 500 or so who boated down these same rivers in Dinosaur last year, a good many were women, children, and retired gentlemen past 70. Of course there are some rapids. One of the three gentlemen mentioned above, a grandfather, told us how much more fun they made the otherwise placid trip. Ironically, the brochure shows photos of some of the many smooth stretches as examples of what these waters will be like *after* Echo Park Dam is built! It has carefully implied that there is nothing now but dangerous white water. A racing speed-boat complete with lovely models in swim suits, on Lake Mead — at high water — appears under the heading "Look what happened on the Lower Colorado." Needless to say, the acres of stinking mudflats at low water are not shown. What happens to all the promised boat harbors and shore facilities, then? . . . And so on and on. We suggest you get it, simply by wiring your protest against dams in Dinosaur, to the President or Secretary McKay, and have your own fun finding the wet spots. You can't miss — they're all over it. Then be sure to get your copy of *This is Dinosaur* when it comes from Knopf in April or early May. It will be a beautiful, and *honest*, book. Let it be an epitaph to the wreckers, not to Dinosaur and thus inevitably other national monuments and parks.

PD'S AUTHORS

Roanna H. Winsor writes of a memorable Apache ceremony as a graduate student in anthropology at the University of Arizona, Tucson. . . . ¶When we saw **William A. Garnett** a few weeks ago, he was up from his home in Altadena on a photo-flying assignment in northern California. Our acknowledgments to Professors **Carl O. Sauer** and **John E. Kesseli** for the notes accompanying Mr. Garnett's air views appear on page 14. . . . ¶**Weldon F. Heald's** Arizona headquarters will soon be Tucson — he is exchanging Chiricahua's pines for the saguaro forests whose preservation he pleads for. . . . ¶We are indebted to **Lloyd P. Parratt** of Ontario's Chaffey High School for the story and photos we have freely adapted to a "Conservation Salute." We regret that the editor's untimely illness kept this issue from coming out *before* Conservation Week as planned. D.G.K.

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APACHE "gan" dancers symbolize the supernatural forces that influence human life. The photograph was taken during a maiden's puberty rites by Pete Balestrero.

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EDITORIAL

Conservation Calls for Coordinated Planning

SUPPOSE—and this is a dream that comes sometime to nearly every American—you were to acquire a little place in the country and start to develop it, either as a week-end refuge or as a place to retire and lead a serene and contemplative life. Suppose you were lucky enough to get a few acres in a fertile valley, with a good building site, a patch of virgin woodland, and a broad meadow with a stream meandering through it. At the lower end of the meadow there is a marsh, from which in spring comes the strident, nostalgic chorus of frogs, and in summer the melodious trill of the red-winged blackbird.

If you were to manage your small private domain the way the public domain is managed, this is roughly how you would go about it:

You would employ three architects for the house, five landscape architects for the grounds, a forester, a tree surgeon, an irrigation engineer, a highway engineer, a biologist, a public health expert, a soil chemist, and a ranch management consultant. Then you engage seven different contractors, give each of them a different set of plans, and go away and await developments.

In due course you come back to see how things are moving along, and this is what you find:

You have a house—at least there is a structure there which was not previously present. The dining room, you discover, is twenty feet from the kitchen, across an open patio which might be inconvenient to negotiate in wet weather. The living room, in which you wanted a high ceiling, has a high ceiling indeed. Owing to the fact that nobody wrote any specifications for a roof, it is open to the stars; and the big fireplace in front of which you hoped to toast your feet on long winter evenings has become an outdoor barbecue.

There are no bedrooms, because the architects could not agree on how many or where to put them. There is a bathroom of sorts. This was completed by the carpenters, plasterers, and painters; but it had a couple of deficiencies—there was no plumbing and there were no lights. Presently the lighting contractor arrived and knocked out quite a lot of the plaster. Then the plumber arrived and knocked out more of the plaster and took up part of the floor. While you are debating whose job it is to repair the floor and the walls, the whole matter becomes academic; your highway engineer tells you the bathroom has to be moved because it is right in the way of the driveway to the garage.

In the meantime your tree surgeon has cemented up all the holes in your trees, thus keeping the chickadees and bluebirds out; and your forester has started to cut the trees down, because your timber should be harvested before it is too late. While you are thinking this over, you stroll down to the swamp, perchance to find a marsh wren. What you do find is a lot of tiny fish floating bottom upward in an oily scum; your biologist had decided to control mosquitoes with mosquito-fish, and your public health expert had decided to control them with a kerosene spray. This does not really matter, however, because your ranch management consultant has already started draining the swamp to convert it into a meadow.

In the meantime your irrigation engineer has found a convenient place to build a dam, and is busy converting your meadow into a swamp. There will be a pond at the lower end in which you can raise fish! At the upper end there will be a marsh, which frogs and red-winged blackbirds and marsh wrens may presently come to inhabit. And you will always have irrigation water available for truck crops in the marsh that is currently being "reclaimed."

This gives you further food for thought, and you wander back to what may euphemistically be called your house. Standing in your open-air living room, with your back to a fireplace that has missed its function, you hear a sound of falling water. On investigation you discover that water from your new dam has backed up and is flooding your basement.

Does this sound silly? Yes. But it is the way your public business is run. Is this an exaggeration? On the contrary, it is a gross understatement.

Bad public planning starts at the municipal level, and grows progressively worse from there on.

Cities invite new industries and seek increased population; then they form smog control districts to seek to cope with a problem they have themselves created. Cities allow themselves to become hardly habitable, then moan over decentralization and the movement of the population to the suburbs. Cities pave new streets, and then allow them to be torn up successively by the sewer department, the water department, and gas company and the lighting company. I have thought that a person could make a tidy sum by going around looking for newly paved streets and laying wagers (if he could find any takers) that the new pavement would be torn up three times in the next six weeks.

If planning by cities seems haphazard and uncoordinated, let us not suppose that the states do any better. Only a few years back the California legislature had to appropriate $2,500,000 to relocate a *new* four-lane highway which traversed the site of the Lexington Dam on Los Gatos Creek, *al-*

though the dam was being planned before the highway was built. It is likely that more such fiascos will occur, because highways are constantly constructed without consideration of future dam sites, and especially because coastal highways and expensive bridges are put in without thought of their relation to the inevitable development of small harbors along our coast.

In considering public planning, or what passes for it, one ruefully reflects on the schoolboy's effort to explain the difference between results and consequences. "Results," he said, "are what you expect. Consequences are what you get."

The consequences of poor and uncoordinated public planning are painfully obvious at the municipal level, become worse at the state level, and at the Federal level become confusion worse confounded.

Here are some of the United States agencies that, in addition to state and local bodies, exercise control over the public domain:

Army Engineers
Atomic Energy Commission
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Fish and Wildlife Service
Forest Service
National Park Service
Soil Conservation Service

These agencies work independently of each other, and often at cross-purposes. All too frequently two of them are spending Federal funds at the same time to achieve directly opposite results. When J. N. Darling was chief of the Fish and Wildlife Service, he pointed out that his department was flooding extensive areas to provide refuges for waterfowl, but was unable to flood new areas as fast as the Bureau of Reclamation was *draining* existing natural marshlands.

Just now the Bureau of Reclamation is seeking funds for the Upper Colorado River Storage Project, which will bring 132,000 acres under irrigation and provide supplemental water to a larger area already under use—this at a time when our main agricultural problem is overproduction, Congress is voting millions of dollars annually in farm price supports, and warehouses are bulging with surplus farm products that often become unfit for use before they can be sold or even given away.

As a matter of fact, the whole upper Colorado project is badly planned, fantastically expensive, and will not produce the results claimed. A river has two ends; and any water that is diverted to irrigation in the upper Colorado basin will be lost to the lower Colorado basin, which is likewise an area of water shortage. The usefulness of Hoover Dam may be seriously impaired. This is robbing Peter to pay Paul, with the taxpayer posting bond and ultimately paying the fine.

In any project for water storage, evaporation has to be reckoned with, and in an arid climate this becomes an especially important factor. The bigger the dam and the larger the lake behind it, the more water will be lost by evaporation. There has been considerable debate as to the exact loss through evaporation at various dam sites under consideration in the upper Colorado project, but all authorities are agreed that the loss is of the magnitude of many hundreds of thousands of acre-feet per year. One hundred thousand acre-feet per year will supply the needs of a city as large as Denver. The water that is lost by evaporation does no good to anybody; it simply disappears into thin air.

The Bureau of Reclamation has twice in succession undergone the embarrassment of admitting gross errors in its calculations of losses from evaporation at alternative dam sites, but it still insists on building the wrong dam at the wrong place—the Echo Park Dam in Dinosaur National Monument. Thus, bad planning becomes compounded by sheer perverseness.

Another aspect of the upper Colorado project is that irrigation is only a minor feature; the real objective is power development. But no one seems to have considered the illogic of a vast hydroelectric project in a region of water shortage. That the upper Colorado is marginal from the standpoint of hydroelectric power is indicated from the fact that the power developed would cost more than twice as much per kilowatt-hour as power presently developed in the Columbia River basin. Competent engineering advice has shown that steam-operated power plants in the upper Colorado basin could produce power more economically than hydroelectric installations, that they could be built more cheaply, and in half the time. And one fourth of the fossil fuel resources of the United States are in the upper Colorado basin.

Furthermore steam plants would be dependable, whereas hydroelectric power even under the best conditions is subject to the vicissitudes of weather and climate.

In 1946 San Francisco experienced a "brown out," with all department store windows darkened and all advertising signs turned off, because of a shortage of power due to a small snow-pack in the Sierra. In 1929-30, during a dry winter in the Northwest, the city of Tacoma—right in the middle of the great Northwest hydroelectric power belt—had to borrow a battleship from the U. S. Navy to generate power for its minimum civic needs. Rain-

fall in the upper Colorado basin is a good deal more precarious than in the Pacific Northwest; and there will be no battleships standing by to generate power when the rains fail and the turbines cease to turn.

Proponents of the upper Colorado development claim that their plans were defeated in the last Congress by conservationists. If this be true, every taxpayer ought to send a freewill offering to his favorite conservation agency as a token of gratitude. For the cost of the *first phase* of this fantastic project would be from one to two billion dollars. (Two bills have been introduced in the present Congress, one calling for an appropriation of one billion dollars, the other calling for 1.6 billion.) The ultimate cost is frankly beyond calculation, and anyhow would be too large for any finite mind to comprehend – and this at the beginning of an era of atomic power that may render the whole project obsolete long before it is even completed.

A sound reason for opposing the Echo Park Dam is that it would violate the sanctity of a national monument, drown under 500 feet of water and silt the best of a scenic recreational area that was visited last year by 70,652 Americans, and serve as a precedent for the violation of other national monuments and national parks. An equally valid reason for opposing it is that the whole project is badly planned and not worth the money.

I do not maintain that there should not be any dams on the upper Colorado. I do maintain that this big dam idea should be abandoned in favor of smaller dams at more appropriate sites, this billion-dollar bingo game should be forgotten, and the whole upper Colorado project should be restudied to the end that any Federal expenditures will produce results instead of merely consequences.

R. C. MILLER.

DINOSAUR NATIONAL MONUMENT is one of the last almost "unspoiled" wildernesses–which means it is relatively unmarked by man. . . . The dinosaur quarry which gave the Monument its name is no more than the front yard of the people's park here established. Back of this natural schoolroom . . . is the living laboratory of the Green and Yampa canyons stretching all the way from the mouth of Split Mountain to Steamboat Rock, and from that natural dividing cliff up the Yampa to Lily Park and up the Green through Lodore to Brown's Park.

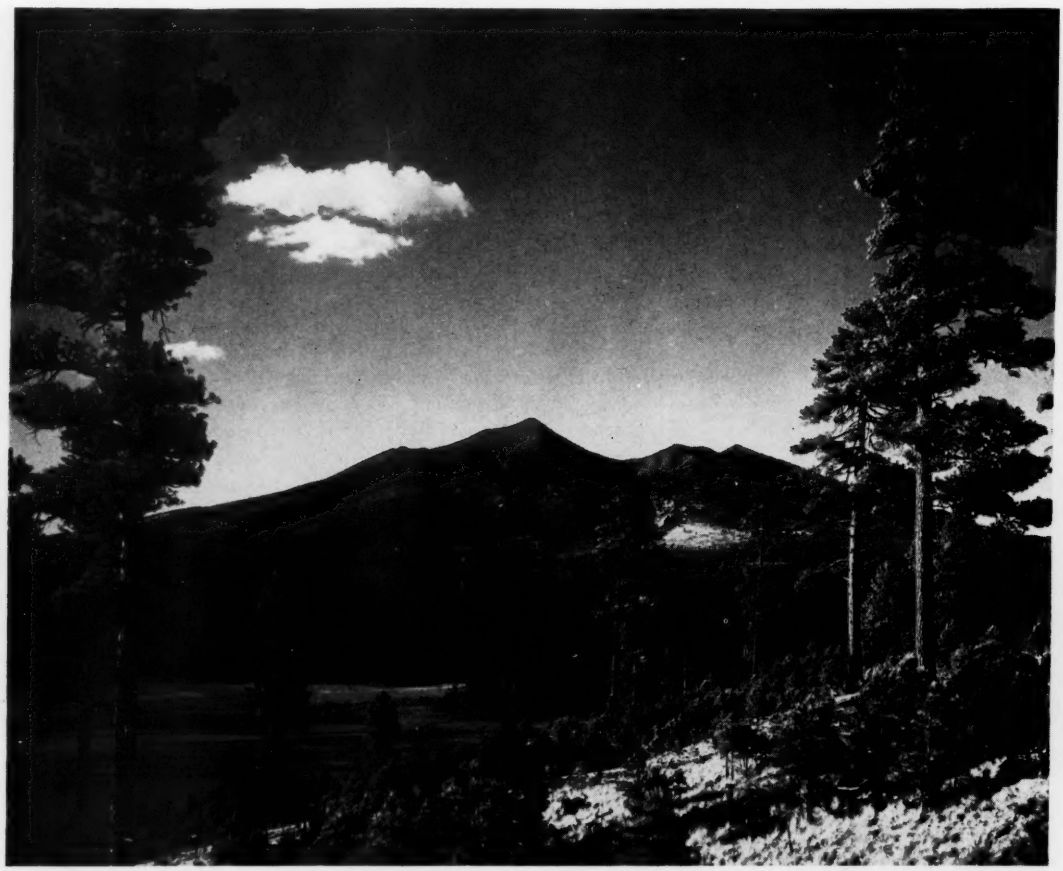
The canyons were added to the Dinosaur National Monument by proclamation of Franklin D. Roosevelt on July 14, 1938, in a move which was part of the national rescue operation to save eroded range lands and mined Dust Bowl fields and endangered watersheds and half-spoiled wilderness areas from total ruin. The consciousness of national guilt and mismanagement, and the press of necessity, were strong then; they are less strong now, when partially successful rescue work and a rainier cycle have temporarily healed many of the scars of the thirties. But to this moment, at least, the Green and Yampa canyons have been saved intact, a wilderness that is the property of all Americans, a 325-square-mile preserve that is part schoolroom and part playground and part – the best part – sanctuary from a world paved with concrete, jet-propelled, smog-blanketed, sterilized, over-insured, aseptic; a world mass-produced with interchangeable parts, and with every natural beautiful thing endangered by the raw engineering power of the 20th Century.

We live in the Antibiotic Age, and Antibiotic means literally, "against life." We had better not be against life. That is the way to become as extinct as the dinosaurs. And if, as the population experts were guessing in November, 1954, the human race will (other things being equal) have increased so much in the next three hundred years that we will have only a square yard of ground apiece to stand on, then we may want to take turns running to some preserved place such as Dinosaur. How much wilderness do the wilderness-lovers want? ask those who would mine and dig and cut and dam in such sanctuary spots as these. The answer is easy: Enough so that there will be in the years ahead a little relief, a little quiet, a little relaxation, for any of our increasing millions who need and want it. That means we need as much wilderness as can still be saved. There isn't much left, and there is no more where the old open spaces came from. . . .

Admittedly it would be idiotic to preach the conservation of such a wilderness in perpetuity, just to keep it safe from all human use. It is only for human use that it has any meaning, or is worth preserving. But there is a vast difference among uses. Some uses use things *up* and some last forever. It is possible to make such a wilderness as Dinosaur accessible without ruining it, and more than possible that its value for human relief from 20th Century strains and smells and noises will prove greater than its problematic, limited, and short-term value for water or power, especially when those values can be had at other sites without violating this unique and beautiful canyon sanctuary. – WALLACE STEGNER, *This is Dinosaur.**

* A symposium, to be published tentatively in April. By permission of Mr. Stegner; courtesy of Alfred A. Knopf, Inc., New York.

A BIG WIKIUP FOR LITTLE FLOWER



Apache country is a land of tall pines and dusty, arid range. (Western Ways: Ray Manley)
(Above) **In trucks, cars, and wagons, they come. (Western Ways: Charles Herbert)**

ROANNA H. WINSOR

APACHE – desert marauder, guerrilla fighter, stubbornly resisting white encroachment on his hunting grounds and dwelling places even while greatly outnumbered and encumbered with his women and children–the very name, "Stranger," of this last of our wild Indian tribes to surrender to superior force, still thrills or chills but in any case commands a certain respect.

Geronimo, Cochise, Victorio, Mangus Colorado – these were names of terror within the time of men still living, when the great Apache war chiefs struck trails of blood across the Southwest borderland. Some had military greatness, all had the greatness of men who preferred freedom to mere living. And when their way of life was inevitably closed, their people sank into sullen lethargy, existing on government bounty, exiled first to Florida, then Alabama and Oklahoma. Finally back in their homeland of Arizona and New Mexico, they tightened their belts, and today are known through the West for their modern, efficient, and highly successful cattle business.

But what a paradox of culture were these Apaches – a roving people by choice, living by raiding, warlike in nature, yet holding in high esteem the veneration of womanhood. Today, as in their yesterdays, the tribe's most momentous religious ritual is oriented around its young girls just entering puberty in a ceremony which emphasizes happiness and peace in the heart.

The Western Apaches live in the mountain country of Arizona. It is a land of infinite variety from dusty desert to high pines, between the Salt and the Gila. These are the rivers of the Apache. Some of their ancestors roamed beside their waters in aboriginal times and the Western Apaches live there now. In the span of four centuries this region has been the scene of prolonged and vicious fighting. Today it is peaceful, The men in the high pine country are tending the great tribal Hereford herd, and the women find plenty to do in the dusty valley around the domed grass wikiups. The sky is a deep intense blue piled high with billowy white clouds.

From mountain and desert they gather at the appointed place. (Western Ways: Pete Balestrero)

In the distance comes a rider. It is not long before quiet murmurs flow from family to family. Little Flower's family is planning a Big Wikiup. From all parts of the reservation travel small groups of people to the camp of Little Flower's people. The men are in western jeans and broad brimmed hats, and the women in wide flowing skirts and loose blouses, not in the buckskin of the days of Cochise. Always there are babies on cradle boards. They set up camp at Little Flower's home, for they will be here for four days. During these four days they will live again the age-old legend of White Painted Woman.

In the beginning White Painted Woman and her son, Child of the Water, cleared the land of evil. Then she commanded her people to come together, to feast, to dance and to laugh and be happy. The rituals will carry Little Flower symbolically through all the stages of her future life into happy old age. She will command her people, for she will be White Painted Woman. She will renew their faith and encourage them to face the future. Her family and these gathered people will help her to be worthy to carry on the traditions of White Painted Woman and the blood of her tribe.

Many months of preparation have preceded this

puberty ceremony. Formerly a special garment was made for the initiate, of softest doeskin or buckskin. It was lovingly and ceremonially executed. It was decorated with designs symbolic of the forces to be supplicated on behalf of the girl — the morning star, crescent moon, a circle for the sun with streaming sunbeam fringes. Bells were attached so that she might make music as she walked. Before the dress was finished all parts were dyed yellow, the hue of pollen and the symbol of fertility. The dress was blessed. These garments are today treasured heirlooms.

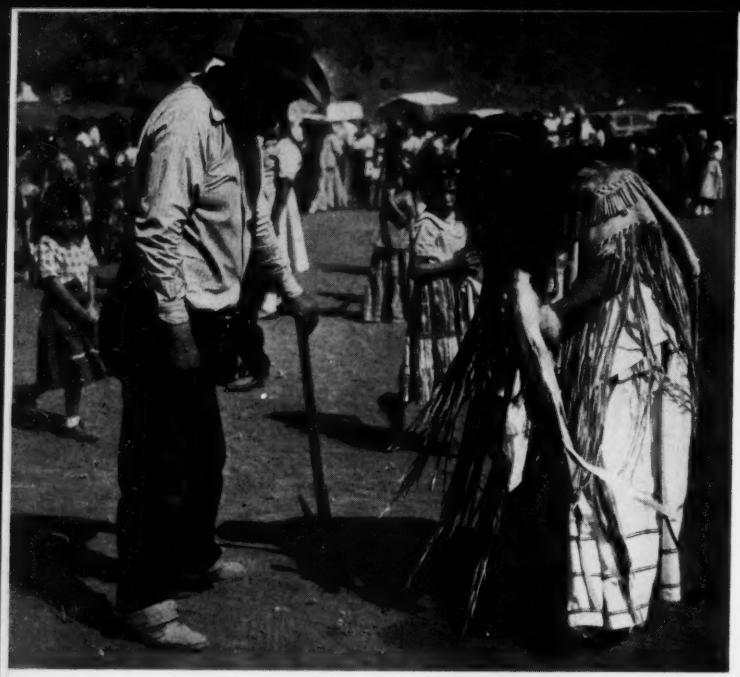
The greatest care has been exercised in choosing the medicine man and godmother for Little Flower. These two through the rest of their lives will act as a second "father" and "mother" to the girl, a responsibility not to be lightly bestowed.

Preparations have been so extensive as to exceed family resources and those outside the immediate kinship group have lent their aid that there may be feasting for the entire assemblage.

For many moons, Little Flower has been receiving long instructions from her godmother. She has listened carefully. This is the most important event in her life. After this ceremony she will no longer be a carefree child of the open spaces. She will be a woman.

The men of her family have brought in four carefully selected tall, straight young saplings. They have sheared them of the branches except for a few at the top. The godmother marks out the

Always there are babies on cradle boards, with their mothers and grandmothers wearing the same flowing skirts and loose blouses they adopted from pioneer women generations ago. (Western Ways: *left*, Pete Balestrero; *above*, Charles Herbert)

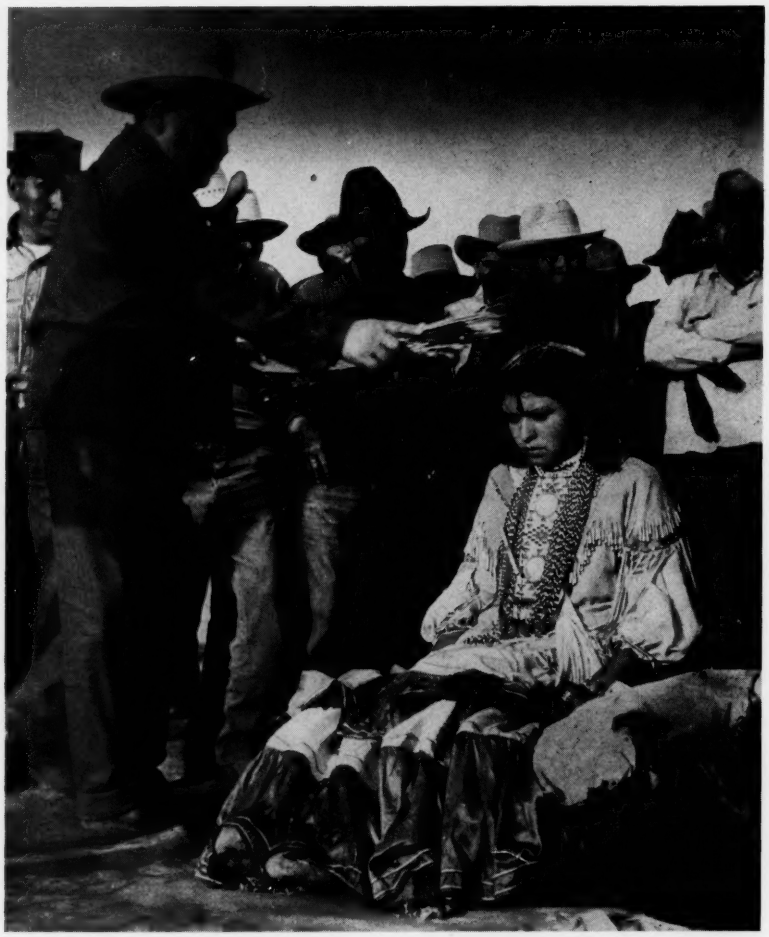


four cardinal points of the compass. Little Flower watches as the trees become the symbolic Big Wikiup, traditional home of White Painted Woman. Two eagle feathers at its top insure stability. The floor is carpeted with pine needles from the high forests. A white deerskin rug is placed near the entrance.

Little Flower's time has come. She steps forth before her people, her hair fresh washed with yucca root and her face sprinkled with pollen. The crowd is quiet as the medicine man blesses her and sprinkles her with more pollen from a brush of twigs. He gives her two eagle feathers and by the light in her eyes and the dignity of her mein, her friends and family know she is believing implicitly in the power with which she is being invested. On her faith depends the happiness and welfare of her tribe. She kneels on the rug

↑ The godmother marks the points of the compass for the Big Wikiup. (Western Ways: Chas. Herbert)

→ The medicine man blesses the maiden while her people gather to watch. (Western Ways: Balestrero)

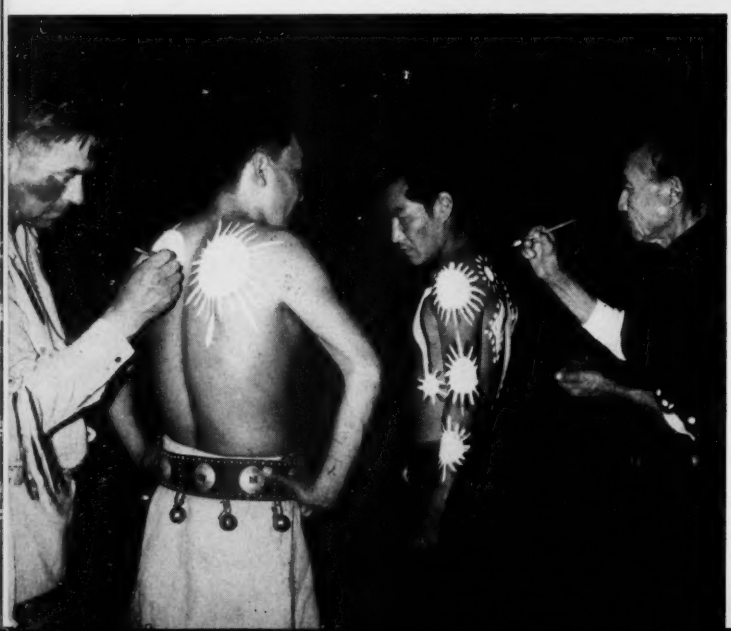


The maiden performs many hours of ceremonial "dancing." Her necklace is symbolic of lifelong wealth. (Western Ways: Balestrero)

The godmother massages the initiate to assure her of a good disposition. (Western Ways: Balestrero)

→ "White Painted Woman" circles the fire with the masked "gan" dancer. (Western Ways: Balestrero)

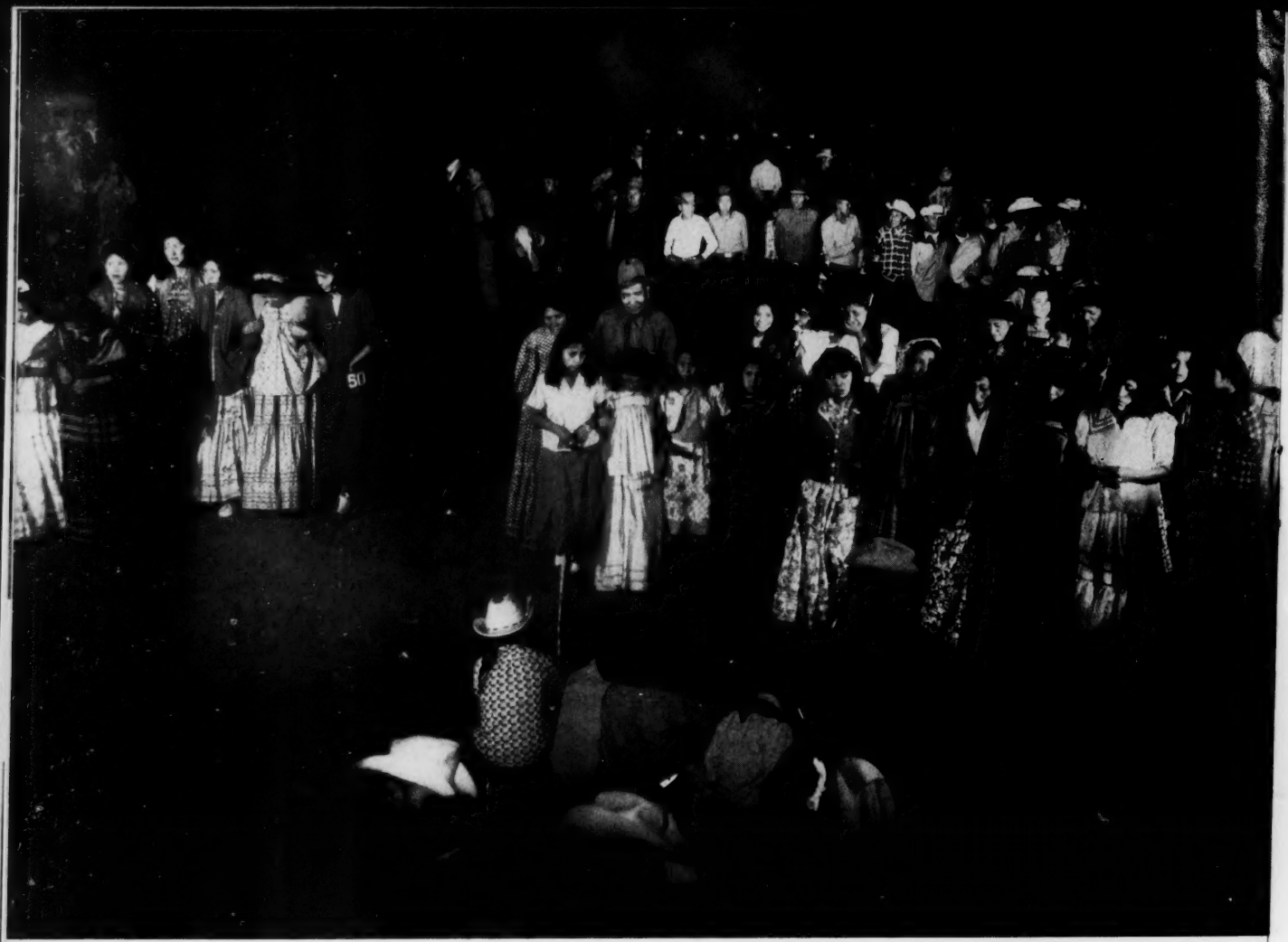
↓ Sacred symbols are painted on the "gans" before the dance. (Western Ways: Balestrero)



and is ready to receive her people. She is White Painted Woman.

Before her pass the ill and the troubled to receive her blessing. Anyone who needs help comes forth. In solemn dignity they approach. When the last tribesman has passed, Little Flower lies down upon the rug, her head toward the east, the home of the rising sun. Her godmother now slowly, and to the incantations of the medicine man, begins to massage her from her head to her right foot, from her head to her left foot, kneading her and molding her that she may be supple and enjoy good health. The crowd is intent. At last Little

With eerie cries the "gans" or mountain spirits jump into the firelight posturing wildly. (Western Ways: Manley)



Flower is lifted up. She is given a mighty shove toward a sacred basket, holding an eagle feather, pollen, a rattle, and the hoof of an elk or deer. She runs to the basket. It is moved farther away. She runs again. It is moved a second time. At the magical fourth try, she seizes the basket and lifts it high in four directions to send away all bad things which might come into her life. When she has done this Little Flower rests.

And now her people, lost in the meaning of the ritual, slowly move toward their camps to eat, finally to gossip and to laugh.

Meanwhile in the hills above the encampment, the "gan" dancers are preparing for their participation. They are impersonators of the supernaturals who live in the mountains. The making of their weird headdresses and the painting of their bodies is a serious business, carefully supervised by a medicine man to the accompaniment of sacred chanting.

It is night now and the people are quiet around the great bonfires. From the darkness comes the sound of rattles. Suddenly with eerie cries the "gans" or mountain spirits jump into the firelight posturing wildly. Over the head is a tight black cloth helmet with slits for eyes and mouth, topped by spreading pieces of yucca slats painted with designs varying from sun symbols to snakes. Below the painted torso a plaid kilt or buckskin skirt is held in place by a leather belt mounted with silver discs. On the stomping feet are native buckskin moccasins. Their arms slash the air and in their hands are long slender yucca sticks with four short cross slats which they clash together.

Then begins the throb of the drum and the wail of the chanters. Around the fire they go, these aboriginal phantoms, bells at the waist and knees beating out the primitive rhythm. Mocking them is Long Nose or Gray One, the clown. His white painted body is bare but for a G-string. As the

Everyone dances in the smoky fringe of the firelight. (Western Ways: Balestrero)

crowd responds the tempo quickens and the music rises. On and on they dance, disappearing for a brief respite to reappear and dance more furiously. The present is forgotten. Gone are the white man's ways. This is a century – or an eon – ago.

And while the dancers perform their rites and the crowd is lost in the past, the medicine man goes to the Big Wikiup where Little Flower is waiting. He gives her an eagle feather, symbol of her temporary deification. After many invocations White Painted Woman, followed by her attendant, files around the camp fire and returns to her dwelling. The masked dancers disappear in a final burst of frenzy.

The spell is broken. There follows a happy time for the tribe. Many link arms and shuffle back and forth in the Apache way of dancing to the chanting and the drums, long into the night.

And so for four days and four nights the rituals continue. At daybreak, following the fourth night, White Painted Woman stands in front of her Big Wikiup and faces east. The sun is rising. The medicine man faces her. Using the eagle feather he gave her the first night, he paints her face with white clay, making the designation of White Painted Woman a literal one. She is freshly daubed with pollen. As the sun's first rays touch her she again makes four tries for the basket of sacred objects. As she reaches it and returns to the Big Wikiup for the last time, the conical structure is pushed over violently toward the east.

White Painted Woman has returned to her spiritual home. Little Flower is a woman.

↑ The medicine man has painted Little Flower's face with white clay, using the symbolic eagle feather. (Western Ways: Herbert)

← She is freshly daubed with pollen at the close of the four days of her ritual. (Western Ways: Balestrero)

Landscapes Through a Flying Lens

AERIAL VIEWS OF THE CANYON COUNTRY BY **WILLIAM A. GARNETT**

RECENTLY *the San Francisco Museum of Art exhibited a group of aerial photographs of California and Southwest landscapes. The fact is not noteworthy in itself – photographs are commonly shown in art museums, especially in those which claim proprietary interest in contemporary and advanced media and trends. Aerial views are familiar bases for modern mapping, their novelty having long since worn off. What brought us up short before this particular exhibit was the intimation of form and design in landscape here revealed as it could have been by no other medium. The effect was undoubtedly enhanced by the sheer technical excellence of the work. When later we had the opportunity of talking with the young pilot-photographer (he handles plane and camera as one instrument), we learned that his sights were on esthetic values first, but he was quick to see the possibility of scientific interest in his unique work.*

Among those who have seen the significance and possibilities in William A. Garnett's achievements in this technically demanding, costly, and rather dangerous medium of expression, is Dr. Carl O. Sauer, distinguished senior member of the Department of Geography in the University of California, Berkeley. Knowing that he was one of the committee which granted Garnett a Guggenheim Fellowship to carry on his work, the editors of PD *were not surprised when Dr. Sauer, at their request, kindly undertook to furnish the geological interpretations of these photographs, which follow. Particular thanks are owing, also, to Professor John E. Kesseli of the Department, whose notes are transcribed here almost verbatim, and to Westher Hess, Department secretary, who patiently tracked down sources and poured over topographic maps in the effort to pinpoint locations.*—ED.

MARBLE CANYON of the Colorado, near Navajo Bridge at Lees Ferry, Arizona (page 15). Sandstone: layering in horizontal strata, etched out by rain wash, incessant beat of raindrop on ground not protected by vegetation – each more resistant layer forming a bluff.

The central hill throws a prominent shadow caused by a series of very resistant sandstone which on the right breaks off in a pronounced cliff. The intricate layering of this knob which is so obvious in the nearly vertical photograph is not revealed in the shadow the hill casts, as the smooth edges of the shadow are cast by the smoother lower slopes of the hill, while the crown of the shadow is cast not by the hill top but by the lowermost circular layer appearing in full light.

The base of the hill is formed of a series in which less well consolidated, possibly argilaceous sandstones dominate, thus causing a general flattening of the slopes down to the lowermost resistant bank, below which rill dissection becomes conspicuous. In these lower layers, rain wash and rill cutting are the fashioning erosive agents which together work at a faster rate than rain wash alone on the capping sandstone, and thereby initiate a steepening of the slopes below the cap rock. The ease of dissection in these lower strata suggests an increase in shalyness of the layers which in the upper left corner appear to change into true shales.

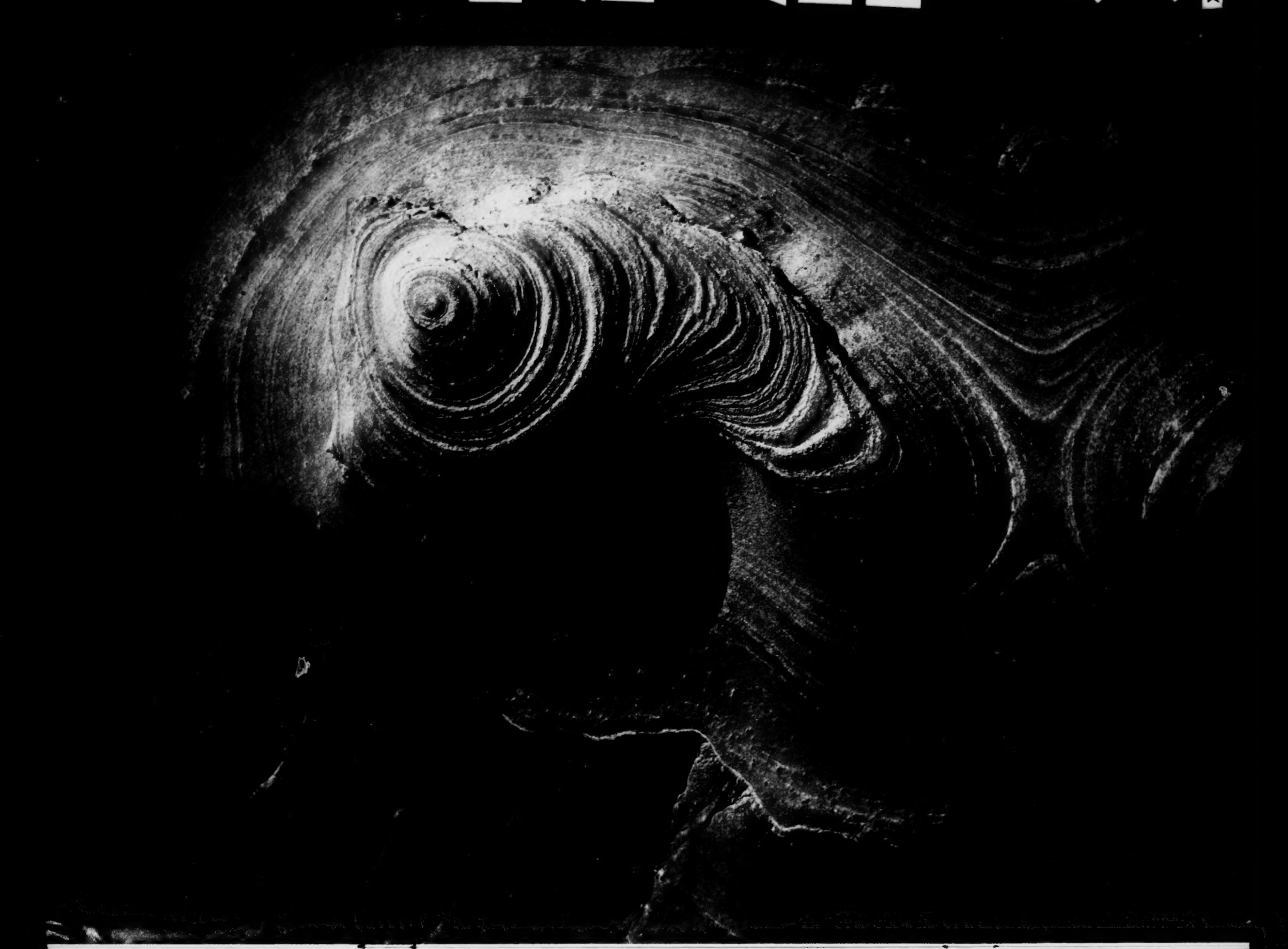
MARBLE CANYON, near Navajo Bridge (page 16). Picture dominated by features etched from softer rocks. The capping sandstone benches free of rill work are here reduced to the small central knoll. below them follows the succession of less resistant, probably argilaceous sandstones with their associated fine network of small rills. In the right half of the picture a sharp line separates these softer sandstones from still softer shales in which rill-cutting changes to typical gully-cutting. The latter is so effective in these soft strata that rain-wash action on the intergully parts lags behind, thus creating the pronounced ridges between gullies. The smooth rounding of these ridges which so obviously suggests "washing" is an effect of the impermeability of the shales.

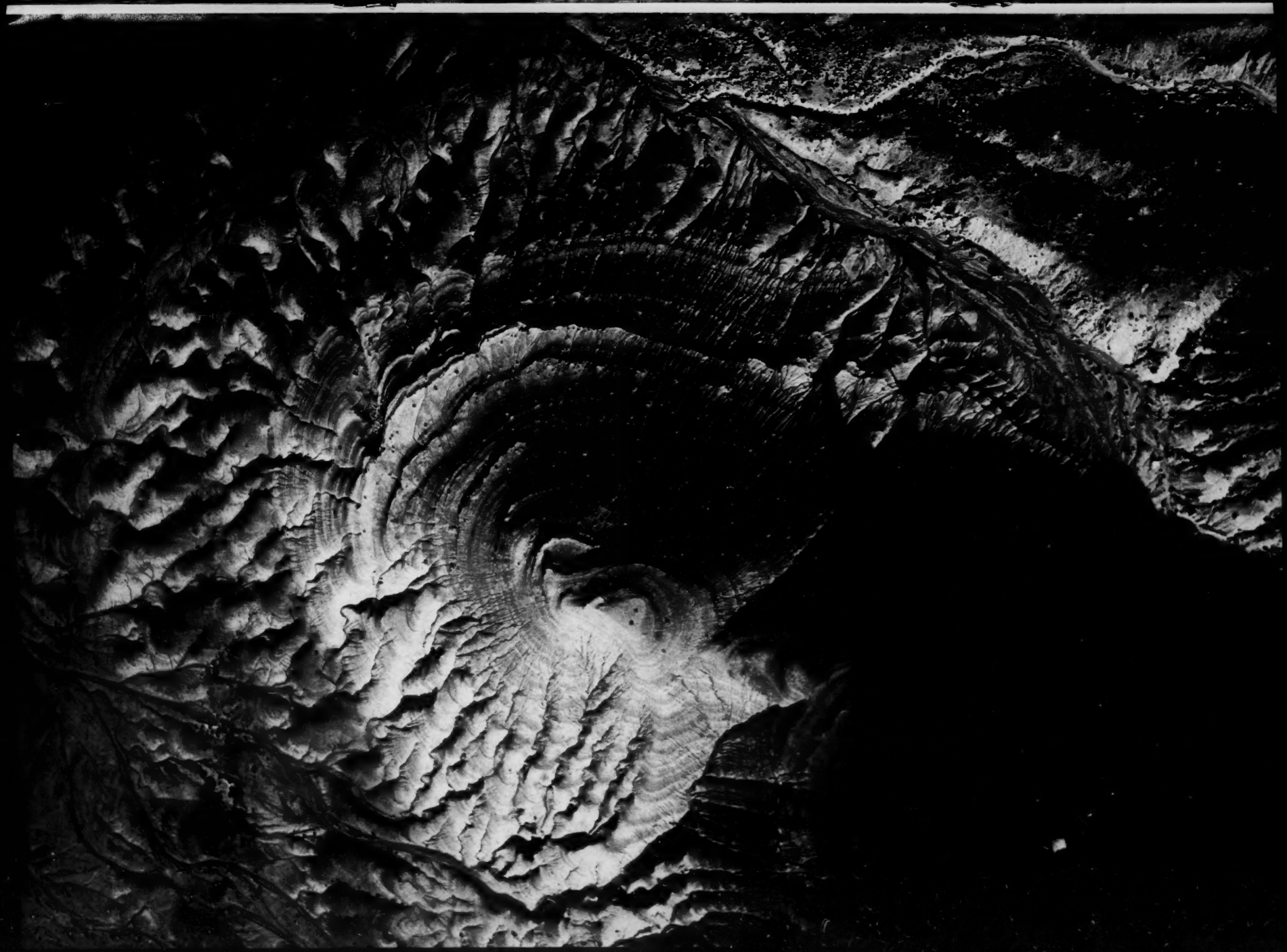
The shadow in the lower left corner reveals that the resistant sandstones are overlain by another series of rocks which weather into castelate forms.

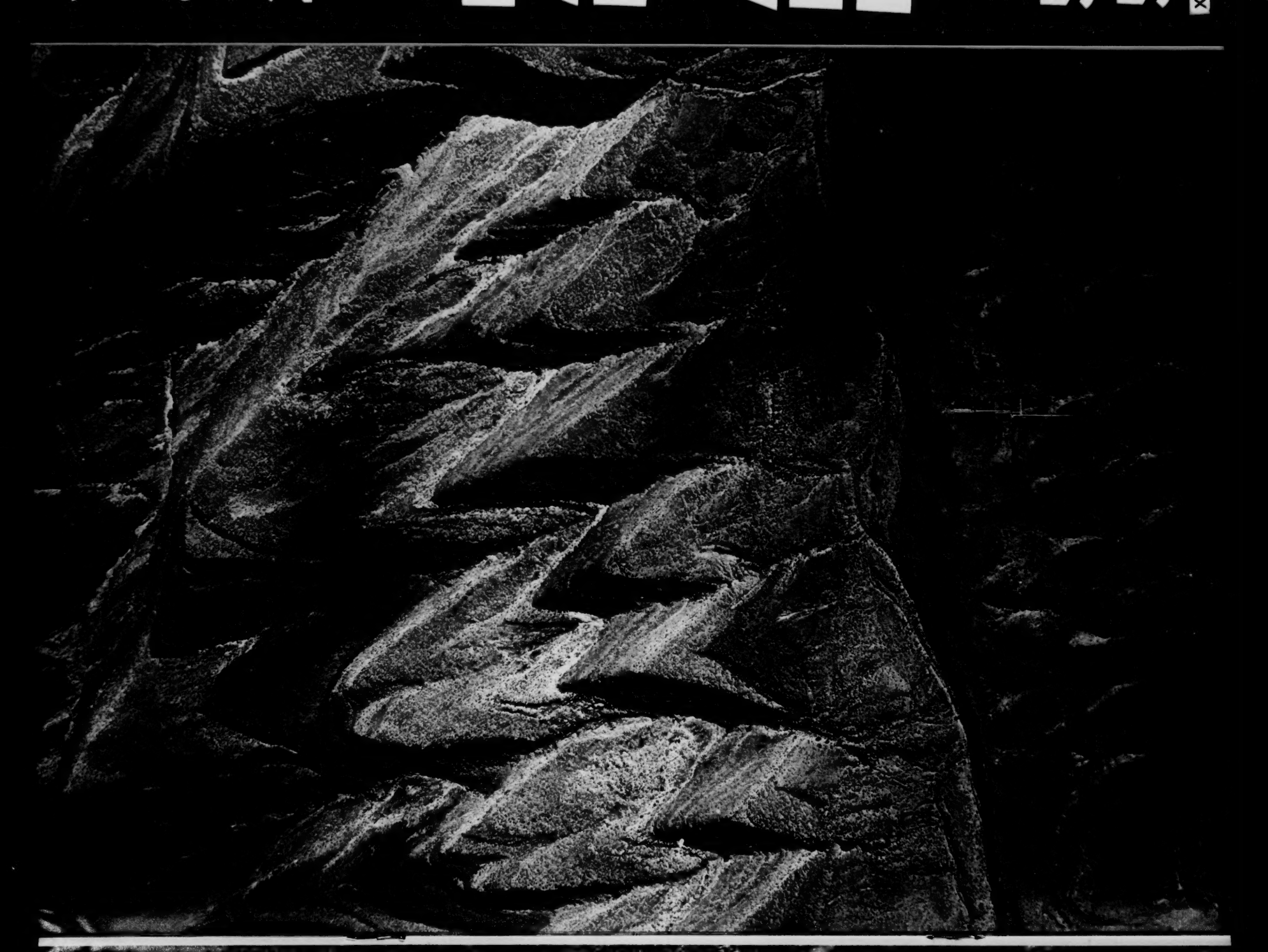
A change in the composition of the strata ("change in facies" to geologists) is quite evident in the gentle slopes below the central knob. To the right of the knob these strata are only barely etched by numerous shallow rills. As one follows these strata around the knoll toward the left a gradual change from rill- to gully-cutting appears, which is probably associated with a change from sandstone to shale.

MEXICAN HAT, near the Goose Necks of the San Juan, at the edge of Monument Valley, Utah (page 17). A fine illustration of a thick series of rock layers, standing on edge, in the process of dissection by slope rivulets. As these rivulets cross the upturned strata, which in this picture lean away from the observer, they cut a \/-shaped piece out of each layer, leaving between them the unremoved parts of the layers in the shape of an inverted /\, or sawtooth – geomorphologists call them "flat-irons." The topography within the picture consists of more than a hundred individual sawteeth. On the lower margin, where the slope descends toward the creek in the foreground, the hill slope and the strata dip in opposite directions – the first, away from the observer; the second, towards him. Here the sawteeth are numerous and small. Across the creek,

(Continued on page 32)

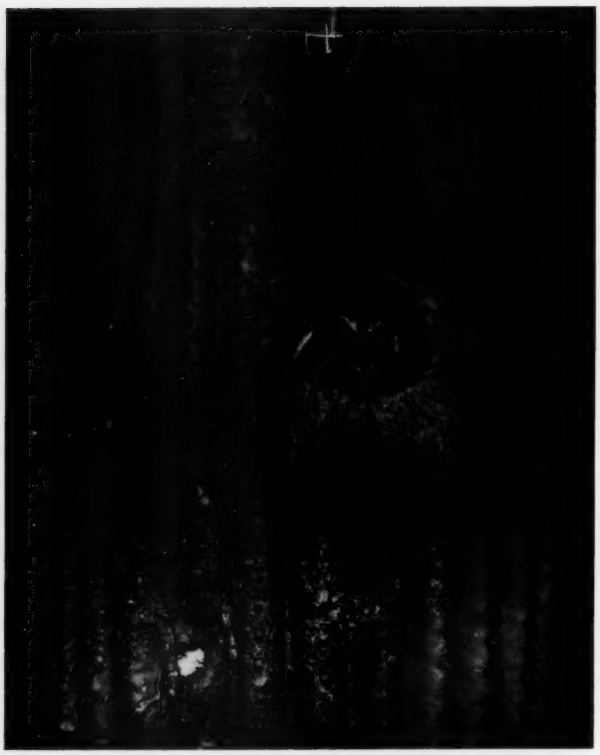






Save Our Saguaros!

WELDON F. HEALD



ALREADY there are dangers threatening the existence of the saguaros and their environment. . . . We had . . . a feeling, as we sat on some mountain ridge in the clean, untarnished open, looking down through myriads of cacti – gazing entranced, illuminated bodily, uplifted and inspired spiritually, and filled with awe and reverence at the desert's radiance and color – that perhaps here was one of the last chances in our country to see an almost untouched world of living, interrelated organisms, just as they had evolved through thousands of years and just about as they were intended to be. But man had put his foot into the picture here and there, and the day might not be avoidable when all such remaining *wild* associations would be only things of the past. . . . Sometimes far above our sanctuary we heard the terrifying roar of jet engines. . . . These sounds withered something within us, for we felt that preparation for devastation must be going on again everywhere if such things had even taken over these peaceful skies, preparations for the destruction of much which man and nature had erected in a long, long struggle. . . . Another . . . danger . . . lies in that magic yet destructive word oil. . . . Once oil is brought in here it will mean the end of the cacti and much of the other wildlife also. . . . How sad it will be if even a part of the unprotected saguaro world is so destroyed, for there is *absolutely nothing else* like this living belt in all the world of nature.—PAUL GRISWOLD HOWES, *The Giant Cactus Forest and its World.**

LONG KNOWN to scientists and naturalists as one of America's unique biotic provinces, Arizona's saguaro cactus desert has only recently been introduced to the general public. But in the past year or so numerous articles, books, and motion pictures are beginning to reveal the region's many marvels, as if it were a newly discovered, distant country! Outstanding examples are Walt Disney's *The Living Desert* and Hal H. Harrison's movie, *Destination Desert,* which graphically present the teeming animal life and the dramatic struggle for existence in this hard, dry land. Among the books, *The Flowering Cactus,* edited by Raymond Carlson, describes the surprising variety of blossoming plants, and illustrates their rare beauty with magnificent color photographs by R. C. and Claire Meyer Proctor. But perhaps the most inclusive work yet attempted is Paul Griswold Howes' book *The Giant Cactus Forest and Its World,* reviewed in this issue of *Pacific Discovery.* It tells in fascinating detail the whole story of saguaroland and its inhabitants, and should be used as a guide by all who explore this part of the Southwest.

Such rapidly growing interest in one of our neglected natural wonderlands is a healthy sign. It promises greater public appreciation and understanding, which should result in more concerted efforts to preserve as much of the giant cactus forest as possible in the future. Unfortunately, no ecological environment is easier to destroy and once gone it cannot be replaced for generations. The saguaro reproduces sparingly from seed and it takes two hundred years to reach maturity. Much has already disappeared before advancing

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▲ Elf owl nests in a woodpecker hole in a giant saguaro. (Western Ways: Karl H. Maslowski)

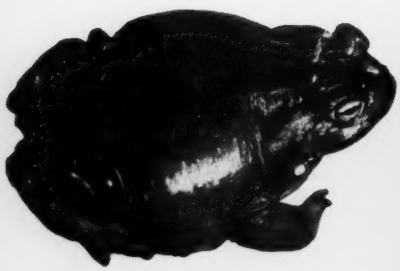
Saguaro forests are unique on earth — "there is *absolutely nothing else* like this living belt in all the world of nature." (Western Ways: Pete Balestrero)

← Pronghorn antelope. (Western Ways: Herbert)

Black-tailed jackrabbit. (Western Ways: Maslowski)

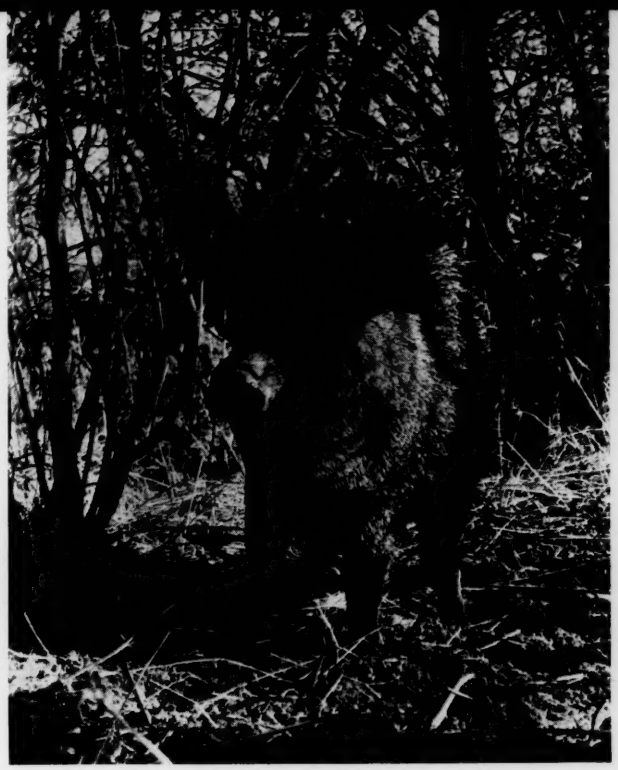
civilization and a greater area has been seriously altered. What remains today in its original natural state deserves the attention of conservation-minded Americans as much as California's sequoias, the bald cypresses of the South, or the Olympic National Park rain forests.

For almost everything about the saguaro cactus is remarkable and it dominates an incredible world within a world, with a particular kind of animal, bird and plant life, and even a special climate of its own. In fact, the saguaro's requirements are so exacting that, unlike most of the 1,600-odd species of the far-wandering cactus tribe, its range is strictly limited to the southwestern quarter of Arizona from 1,000 to 4,000 feet elevation, with extensions into northern Sonora, Mexico, and along the Colorado River in California. It was named saguaro (suh-wah′-ro) by the In-



↑ Colorado River toad. (Western Ways: C. F. Stoody)

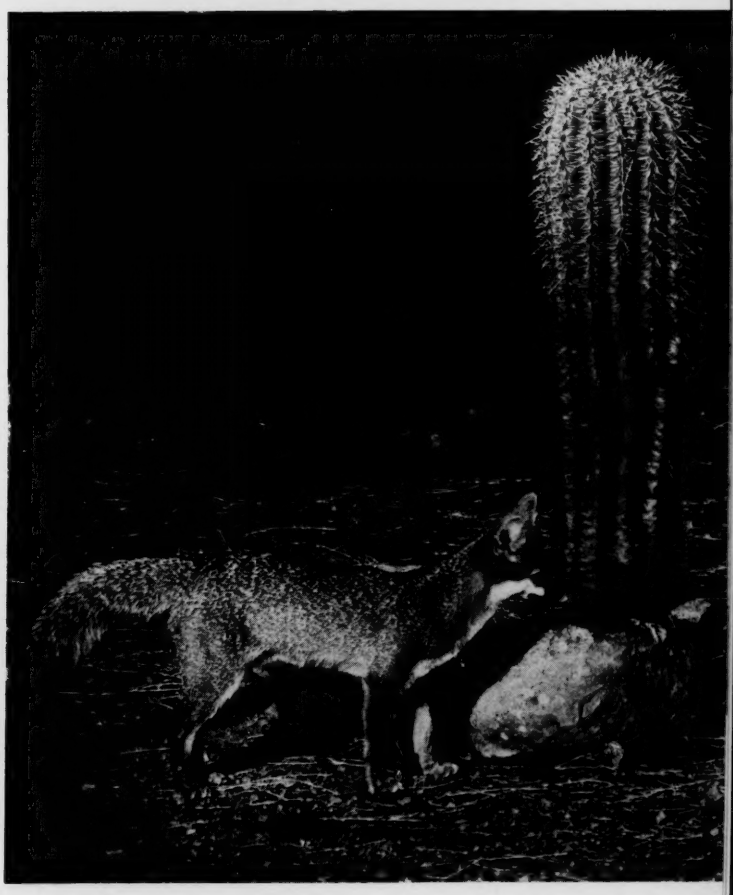
→ The bobcat belongs in this world of spine and claw. (Western Ways: Balestrero)



Peccary and coyote live here.
(Western Ways: Andy Palmer)

dians, and by botanists *Cereus gigantea,* whence its second name, giant cactus. Exceeded in size among all the Cactaceae only by Mexico's Pringle cereus, the saguaro is a massive, single-stem cactus, standing ten to fifty feet high and from ten inches to two feet in diameter. From the fluted green central column spring one to a dozen branches, usually ascending parallel to the trunk, candelabra fashion, but often curved, twisted, con-

There are many kinds of pocket mice.
(Western Ways: Maslowski)



Gray fox. (Western Ways: Stoody)

Ground dove nesting in a prickly pear. (Western Ways: Maslowski)

torted or drooping. These huge waving arms give to the saguaro a startling appearance, as if they were grotesque beings from another world with a spectral resemblance to men and animals. There is nevertheless a feeling of vibrant life and friendliness in these ponderous, awkward plants and one never seems to be alone in their company.

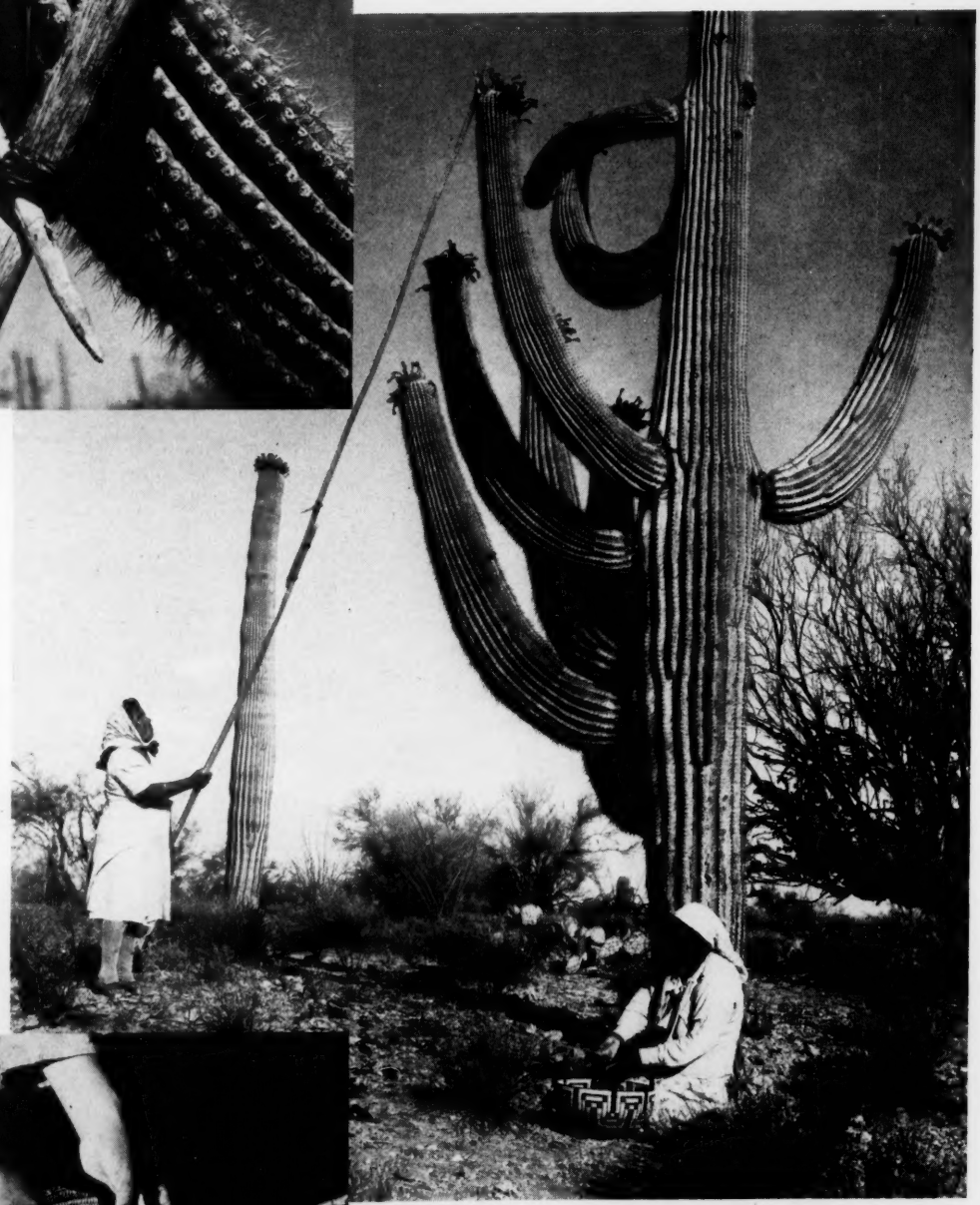
Over hill, valley, and mountainside march the saguaros in groups, ranks, and clusters, forming a bizarre, leafless "forest" as uncanny as anything out of science fiction. Scattered among the giants are scores of smaller cactuses and other desert shrubs, all bristling, spiny, or spiked. In this arid environment a surprisingly busy life goes on, as

Gambel quail. (Western Ways: Maslowski)

Thunder-heads with their showers keep the arboreal desert alive in the long months from winter to winter of rain and snow. (Western Ways: Herb Paustian)

The white-winged dove "feeds largely on saguaro seeds during the fruiting season." —T. H. Kearney. (Western Ways: Maslowski)

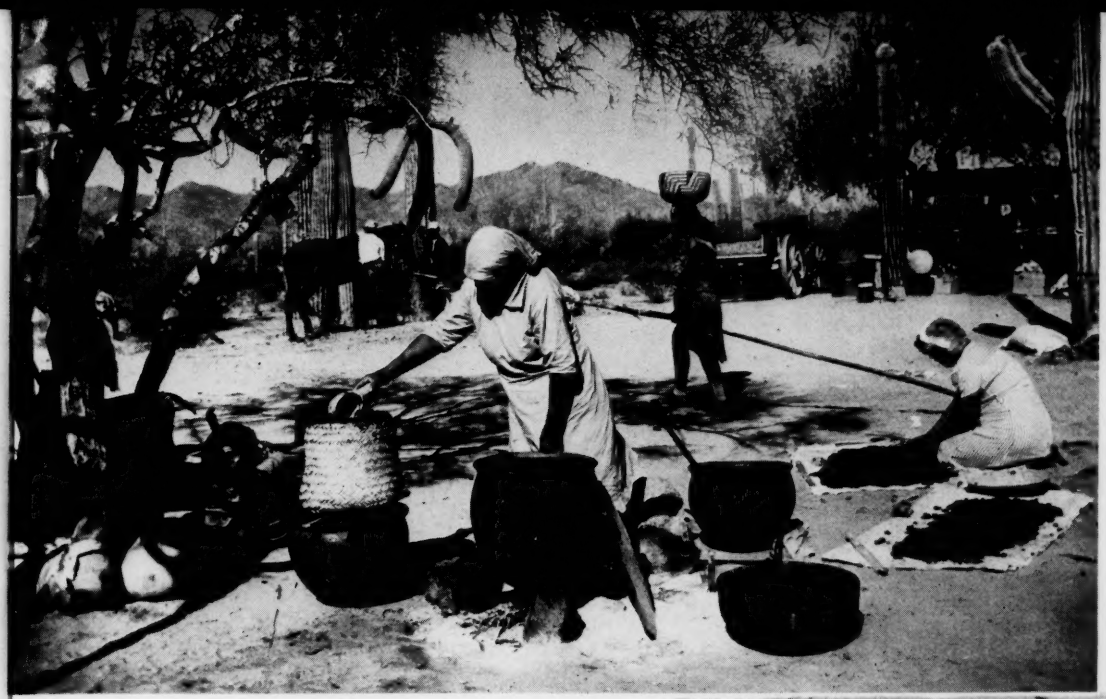
interesting as it is varied and complex. Here is the favorite home of the tough peccary or wild pig. The fierce jaguar and rare ocelot have been known to roam the giant cactus forest. Mountain lions



"Early in the morning all the female members of the household could be seen proceeding on their fruit-gathering expedition, each armed with a large basket and the usual pole, about 20 feet long and made from two pieces of saguaro rib. At the top of the pole, as well as lower down, there is a kind of hook made by tying crosswise in these two places a small piece of greasewood by the aid of which the spiny fruit is broken off. Two or three hours later they returned, each carrying on her head her share of a heavy harvest." (Western Ways: Manley. Detail: Herbert)

and bobcats hunt there. Mule deer frequent the water holes. There are also Mexican "lobo" wolves, coyotes, foxes, rabbits, ground squirrels, rats and mice and, going down the scale, a remarkably

"The skin with its spines had been removed in the field, so the inside of the huge water-tight basket presented an appetizing mass of crimson fruit pulp, as well as a great amount of similarly colored juice, which would keep for a few hours only." (Western Ways: Herbert)



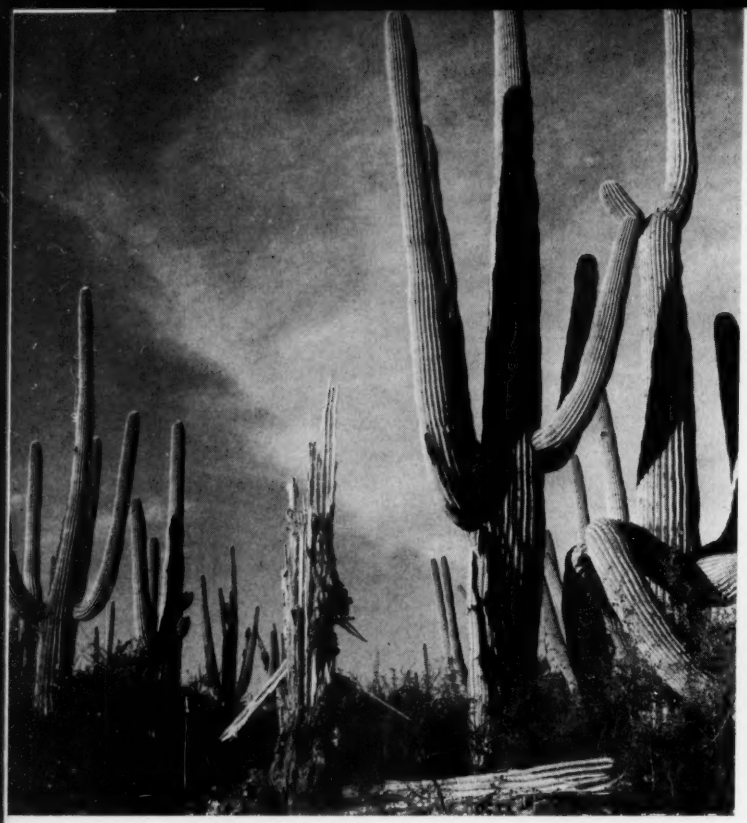
"Their camp consisted simply of a roof of branches resting on four poles, sufficient to provide some shade during the day."

"Most of the contents of the basket was immediately emptied into large jars, to be boiled for about two hours, when the mass is strained [through a basket with open-mesh bottom] in order to separate the numerous small black seeds." (Western Ways: Herbert)

rich reptile and insect population. All of these wild inhabitants, from the largest to the smallest, live in a closely interrelated sociological community which is directly dependent upon the unique character of the giant cactus forest itself.

The region, too, is one of America's outstanding bird localities. Dr. Herbert Brandt in his book, *Arizona and Its Bird Life*, states that at least 170 of the continent's 650 full species of breeding birds raise their young in the mountains, valleys, and deserts of the southern part of the state. Typical of the saguaro forests are the Gila woodpecker, cactus wren, Arizona cardinal, crested flycatcher, phainopepla, Bullock oriole, roadrunner, gilded flicker, white-wing dove, and elf owl. The last, an appealing sparrow-sized midget, lives in cavities excavated in the saguaros by the woodpeckers. In early spring the number of birds is almost unbelievable, for then the permanent feathered pop-

"The juice is boiled for hours longer until it becomes sirup *(sítoli)*, which is kept for future use in small earthen-ware jars, each neatly sealed with a piece of broken pottery and sticky mud. Being pleasant to the taste and much superior to molasses, I also relished the fresh juice of the fruit when brought in cool in the morning."—Quotes from Carl Lumholtz, *New Trails in Mexico*, Charles Scribner's Sons, New York, 1912. Papago customs change little from generation to generation! (Western Ways: Herbert)



Paul G. Howes speaks with grave concern about the malignant disease that is destroying many saguaros; it still baffles science. (Western Ways: Herbert)

ulation is augmented by summer visitors and those passing through on their way north.

The giant cactus forest is also a year-round flower garden. Almost every tree, shrub, and plant bursts forth into blossom at some season, and after the winter rains the desert is spread with a carpet of wildflowers. During May and June the cactuses put on their annual show. Then the prickly pear, chollas, barrel, fishhook, rainbow, and all the others display spectacular waxy blooms of yellow, orange, pink, red, lavender, purple and pale green. Topping them all, the lordly saguaros bear clusters of creamy white blossoms at the tips of their stems and branches, so striking that Arizonans have chosen them as the state flower.

The reason for this prolific animal and plant life, unusual for a desert area, is the special kind of climate the cactus forests enjoy. Rainfall is generally heavier than in the deserts of California, Nevada, and Utah and, as is not the case with them, much of it occurs during the growing season. In the Tucson section, where the saguaro reaches its climax, annual precipitation is ten to twelve inches, a large part of it falling in July and August as afternoon thunder showers. So, although summer temperatures rise to 100° – 110° F., it is the season when the desert is greenest and in places surprisingly luxuriant, with plants, grass, and a host of annuals making this arid land as green as the Vermont hills.

Before the coming of the white man the Indians were also a part of the saguaro forest life community, and they depended upon the giant cactus for food, drink, and shelter. They used the woody rods of the saguaro's skeleton for their dwellings and made a variety of cakes, jellies, and beverages from the seeds and bright red pulp of the fruits. On the reservations today many Indians continue to utilize the cactus as their prehistoric ancestors did, and the Papagos still begin their new year with the fruiting of the saguaro, while to the Pimas July is known as the saguaro harvest moon.

Although the saguaro has practically become the standard state symbol, and has been looked upon as good tourist bait for many years, white Arizonans have been less considerate of this unique plant than their red predecessors. Profligate, wasteful, and indifferent as this youngest state – still in many ways a pioneer state – is towards its natural and scenic resources, the giant cactus forests have been too often looked upon as something to be gotten rid of when people moved in. Untold acres have been bulldozed into oblivion in order to make towns and subdivisions into poor imitations of the East. In fact, few saguaros remain within the city limits of Phoenix, Tucson, and other southern Arizona towns. Along the highways stretch hot, dusty desert subdivisions with every vestige of vegetation removed. Here homeowners hopefully plant and water scraggly trees and struggle with degenerate alien lawns, unaware that they have been robbed of a beautiful indigenous environment that would require no care whatsoever.

Indeed, modern civilization, sweeping across this fast-growing state and penetrating every nook and cranny, is a serious threat to the remaining stands of the giant cactus. Almost universal overgrazing has radically changed the character of large areas; the quickened pulse of prospecting and mining due to the uranium boom is destroying many sections; and new building projects, defense military activities, towns, and superhighways are invading the threatened saguaro forests at an alarming rate.

Fortunately, there are already a few areas that are preserved in a natural or semi-natural condi-

Saguaro National Monument, Arizona, preserves a saguaro forest. We must preserve our national monuments! (Western Ways: Manley)

tion. Among the largest are Saguaro and Organ Pipe Cactus national monuments, Superstition Wilderness Area, Phoenix South Mountain Park, Papago State Park, and Tucson Mountain Park. But except for the Federal monuments protection is only nominal and many of the finest stands of saguaros are doomed unless public opinion can be aroused in their defense before it is too late.

There are, however, encouraging signs that the recent articles, books, and motion pictures are bringing about a change in attitude. Arizonans are fast becoming aware of the beauty of their blossoming desert wonderland and are beginning to appreciate it as a desirable and delightful environment in which to live. New homeowners are now proud to have saguaros beside their front doors and some recent subdivisions are being planned to disturb the native vegetation as little as possible. If this growing appreciation can be crystalized into specific efforts to preserve a large part of Arizona's remaining saguaro forests, it would be a major victory for American conservation. For it would mean that one of our most distinctive environments and landscapes would be saved for the enjoyment of present and future generations.

Conservation Salute

ON the occasion of Conservation Week, March 7-14, *Pacific Discovery* salutes the Botany Club of Chaffey High School, Ontario, California. The club has tackled the problem of conservation from two directions, and on both avenues it is doing a job deserving of attention and respect.

As a first approach the club has assumed the leadership in Conservation Week activities at school, arranging for slogan and essay contests, posters from the art classes, a school assembly program—all devoted to the idea of preserving our natural resources. But the members of the club more than a year ago came to the conclusion that educational activities, important as they may be, are not enough. Some one has to spend money and energy undoing the damage caused by the uninformed, the unthinking, or as their prize-winning slogan put it, the *careless fool* ("Ruined timber, gaunt and gray — some careless fool has passed this way").

The students at Chaffey know more than many of us about forest fires. They witnessed the destruction caused by the devastating fires that swept Angeles National Forest to the north of their school in December 1953, and early January, 1954. The students learned that 10,580 acres had been wiped out in both the Angeles and the San Bernardino forests, an estimated damage of $2,597,000, the price of a carelessly thrown cigarette. The suppression cost, alone, had been half a million.

Almost before the smoke had dissipated the club had decided upon its second approach to conservation. Under the leadership of its sponsor, Lloyd P. Parratt, biology instructor and a seasonal park naturalist, the Botany Club got in touch with the Los Angeles County Department of Forestry. Arrangements were made for the Department to supply the club with some three hundred seedlings, 150 Coulter pine, 150 knobcone pine, plus a few incense cedar.

With the help of District Ranger Anselmo Lewis of the Forest Service staff at Angeles National Forest, the students picked a site for their replanting. Spring Hill, in San Antonio Canyon, below Mt. Baldy, was chosen. The actual planting was done under Forest Service Ranger Wiley Messer's supervision in early February, soon enough for the seedlings to have the advantage of winter rains.

The choice of Coulter pine, knobcone pine, and incense cedar was made on the basis of Forest Service research which proves these three trees to be well suited to survive in southern California. The knobcone,

▲ *(Upper right)* Ranger Wiley Messer and sponsor Lloyd P. Parratt explain to club members the proper methods of planting incense cedar seedlings, with a background of burned-over chaparral. *(Left)* The Botany Club of Chaffey High School, Ontario, California, about to start a forest. *(Lower right)* Mr. Parratt and club members planting pine seedlings.

Timber IS our life!

Timber in Your Life. By Arthur H. Carhart. Introduction by Bernard DeVoto. J. B. Lippincott Company, Philadelphia and New York. 1955. 317 pp. $4.00.

In what may be considered a sequel to his *Water or Your Life* Art Carhart takes up the subject of timber, forests, the uses of wood, and the work of the Forest Service in his usual interesting and lively manner. Few city dwellers who know little more of the subject than a casual glance at a lumber yard and a visit to the forest in the summer can realize the complex and manifold uses of wood in our civilization or appreciate the highly complex task of the modern forest ranger. The day when the ranger had to know how to pack a horse and cruise a bit of timber is almost ancient history now. The principal service that this book peforms is to remind us that we have been struggling to preserve our timber against all sorts of grabs since Colonial times, and in his twelfth chapter, "Concerning the Land Grab Gang," he tells a frightening story of behind-the-scenes machinations that have burgeoned since our latest political dispensation. Well meaning Congressmen and even some conservation people have been skilfully led astray, and outspoken professionals in the Forest Service have been elevated upstairs or mysteriously transferred to less controversial posts, and what is even more disturbing, letters by citizens submitted for inclusion in the records of a Congressional hearing were carried back by a private party to the writer. If those of us who object to this sort of thing are to be called "pool-hall conservationists," let us accept it as an honorable title and carry on the good fight at these lower levels while the higher echelons hold their prayer meetings in the middle of the road. Certainly one thing is plain: without a strong leader in conservation policy like Theodore Roosevelt in the administration, it is up to informed and enlightened citizens to step up to the barricades. It is books like *Timber in Your Life* that show us the way and alert us to the dangers.

JOEL W. HEDGPETH

Scripps Institution of Oceanography, La Jolla

Little one-armed giant

Beyond the Hundredth Meridian: *John Wesley Powell and the Second Opening of the West.* By Wallace Stegner. With an Introduction by Bernard DeVoto. Houghton Mifflin Company, Boston. 1954. xxiii + 438 pp., 12 halftone illustrations, folded inset panorama, 7 maps. $6.

In his opening chapter to the forthcoming book quoted in our editorial pages, Wallace Stegner says of Major John Wesley Powell: "It was from the Canyons of Dinosaur that he drew much of his early knowledge and the hints that a long career would develop into policies of land and water and settlement vital to half the continent," a career through which the one-armed explorer of the Colorado "was later to have a greater effect on the development of the West than any other man." And in his recent book *Beyond the Hundredth Meridian* the Stanford University English professor has given us less a biography of Powell than a history of the idea of the West as it was thrashed out in the thinking of Powell, his adherents, and his opponents. Stegner's book has a peculiar timeliness now – right now – even more than might have appeared a half year or so ago when it was published. For it frames in historical reference the Dinosaur controversy, at this very moment the hottest conservation issue before the public, making it quite clear that this is no isolated incident but a major battle in an all-out war that began in Powell's own time (Arthur Carhart's *Timber in Your Life* documents another phase of the same war of interests at odds).

In his pungent Introduction, Bernard DeVoto sets this unique and necessary Powell evaluation over against "four fixed and indestructible stereotypes about the West (–'its cult of action, rough individualism, physical freedom, and adventurous romance'–), all of them meaningless." DeVoto's "part here is to explain why writers of history have for so long failed to understand the massive figure of John Wesley Powell and therefore have failed, rather disastrously, to understand the fundamental meaning of the West in American history." If DeVoto opens the mind to the idea that Powell has a large claim on understanding, Stegner fills it with the conviction that the non-appreciation of Powell has left a serious gap in the American's – especially the Westerner's – self-knowledge. Powell is truly a "hero of history."

Lest one who knows Darrah's recent biography of Powell raise the question, why another: Stegner does not dwell on the intimate details of the Major's life. Just as a person, indeed as a great man, Powell is worth knowing in as much detail as biography can muster. In his title, however, Mr. Stegner announces a larger purpose – beyond the hundredth meridian the West lay split two ways in the national mind; the "plot" of the book is Major Powell's lifelong effort to tear out the false West and instill the true, the "villains" being those of various stripe who stood to gain by the hold on men of the mirage of limitless exploitation. If Mr. Stegner were merely writing history, his book would stand henceforth as source – definitive – for a decisive phase of the shaping of our American West during the "opening up" period from the Civil War to the turn of the century. As Western history it has to do chiefly with the area of Powell's own explorations and survey activities,

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moreover, is equipped with its own reforestation device, for the fire that sears an adult knobcone also triggers its cones into opening up. Soon after a fire has passed the tree drops a litter of seeds on the charred earth to begin a new generation.

As a test, half of the seedlings were planted on burned-over chaparral and the others on an unburned area that had been cleared with a bulldozer. The students will make a continuing study of the survival rate in both areas by species.

Club plans call for the replacement of dead seedlings and the planting of 300 additional ones each year –plus the continuance of the education program in the school centered around Conservation Week. *Pacific Discovery* commends the club. If fate, the rangers, and an enlightened citizenry prevent future fires in the Mt. Baldy area, Spring Hill will once again be blanketed with chaparral, sturdy pines, and cedars. And one thing is quite certain: if "some careless fool" passes this way again, he will not be from Chaffey High!

the intermountain or Great Basin and Southwest plateau territories. If he were merely writing about Powell the explorer (he gives 70-odd pages to as lively and racy a retelling of the running of the Green and Colorado rivers through their awesome canyons as you will ever read) and bureaucrat, this is where one would go who wanted the story of Powell's pioneering in Government science, his creation of the Geological Survey and the Bureau of Ethnology, his gigantic effort to get the West (and ultimately the nation) mapped so its true nature as a land of rugged mountains, deep canyons, range, desert, – and scant water, – would be known and its peculiar problems understood.

Here is the story of Powell's crusading battles; the ceaseless struggle for appropriations, the fight to establish principles of conduct and action in the public interest, and to keep the new Government scientific bureaus as free of political or other control as the Smithsonian Institution itself. His pressing for an Irrigation Survey projects him more immediately into present controversies than perhaps anything else. The key to Powell's concern over what the nation did with its lands beyond the hundredth meridian was the fact that, as DeVoto says, "there isn't much rain out west." Nature set limits to be transgressed only at the cost of disaster – witness the Dust Bowl.

If there is a conservation hall of fame, John Wesley Powell belongs there – how surely is perhaps not as well recognized as it should be, even by some conservationists. Mr. Stegner's eloquent book not only puts him firmly in his niche, but re-emphasizes in the account of his works and his plans and hopes and fears the great and changeless truths he taught America about the West. D.G.K.

Big green-armed giants

The Giant Cactus Forest and Its World: *A Brief Biology of the Giant Cactus Forest of Our American Southwest.* By Paul Griswold Howes. Duell, Sloan and Pearce, New York; Little, Brown and Company, Boston. 1954. xxx + 258 pp., 186 photos, field sketches, and diagrams, 1 color plate. $7.50.

When the curator of the Bruce Museum of Greenwich, Connecticut, Paul Griswold Howes, and his wife went to Arizona to take a "roll call" of the life of the great cactus forest belt, they soon found there was no book to serve them as introduction and guide to "the whole vastly interesting biotic association of which the giant cactus or saguaro is but a single representative in what seems to be a unique climax forest." So they set out to produce the missing book. The gap would be filled for the benefit of all who followed them in research there; and especially, they hoped, such a book would stimulate the interest and appreciation needed to ensure the future of the giant cactus and all that goes with it.

Mr. Howes brought to the study of this natural complex that is like "absolutely nothing else" on earth a lifetime of diverse experience as naturalist and explorer beginning wtih the American Museum's Colombian Expedition in 1913. He spent a year with Dr. William Beebe in the Guiana jungle and co-authored with him and G. I. Hartley the book *Tropical Wildlife in British Guiana.* A pioneer in insect photography, Howes has several more popular books of his own behind him. *The Giant Cactus Forest* is the fruit of rich and wide experience – the kind, in field work, that enabled him to go into what to most of us would be an utterly bewildering situation if unfamiliar, and make sense out of it through his mastery of biological principles – the rules of the game of life that are constant however varied the forms. An essential part of his experience behind such a satisfying book is evident in his titles, *Insect Behavior* (1916), *Backyard Exploration* (1927-1935), and *Handbook for the Curious* (1936) – all emphasizing illustration. The present book also is enhanced by his own vigorous pen drawings, which tell much that the many photos can not. There is evidence throughout of the author's own careful attention to the fine points of format and arrangement that result in an inviting and useful book.

All this background and detail would add up to little for the general reader if the author failed to take him along in his written pages and make the experience his also. Mr. Howes succeeds handsomely. Whether he is analyzing the emotional impact of an environment as strange to most as sea-bottom or jungle would also be; running down the list of different cacti or shrubs with telling bits of description; engaging your sympathy for kangaroo rats while speculating on convergent evolution; or showing us the incredible variety of "desert" bird life, he makes his reader the chosen companion of his own intense pleasure in these things. And he does it without ever getting into the stickiness that besets a few writers on nature subjects. This is a book to discover, to enjoy before you go – and certainly to take with you when you go to see the saguaro forest. D.G.K.

Animals of the Southwest Deserts. By George Olin. Drawings by Jerry Cannon. Popular Series, No. 8. Southwestern Monuments Association, Gila Pueblo, Globe, Arizona. 1954. 112 pp., numerous illus. in line. Paper, $1.00.

Another in a series of useful guides to the natural history of the Southwest, with emphasis on the many national monuments (44 are indicated on a sketch map of the area from the upper Colorado to the Colorado Desert and east to the Pecos). Non-technical; contains abundant descriptions of the habits of the various animals from bighorn to pocket mouse.

DISCOVERY IN BOOKS

"Every man a special kind of artist"

The Eagle, the Jaguar, and the Serpent: *Indian Art of the Americas – North America: Alaska, Canada, the United States.* By Miguel Covarrubias. Alfred A. Knopf, New York. 1954. xviii + 314 + xi pp., 12 pages in full color, 112 line drawings, 100 photographs. $15.00.

In 1937 a beautiful book entitled *The Island of Bali* revealed Miguel Covarrubias to the world as more than just an exceptionally gifted young Mexican artist. Nine years later he again made publishing history. *Mexico South: The Isthmus of Tehuantepec* still stands as a model for the full-round description and interpretation of a region in word and picture. (With these two in mind, and his magnificent third book in hand, this is a good place to remark that Covarrubias is as fortunate in bearing the imprint of a publisher with the discernment to go "all out" in the graphic presentation of him, as Alfred A. Knopf is to have Covarrubias on his list.)

Now with *The Eagle, the Jaguar, and the Serpent* Miguel Covarrubias' full stature is evident. The Guggenheim Fellowships he held while working on both his previous books were recognition of attainment as well as promise. For the past several years he has been professor of art history in Mexico's National School of Anthropology. His views on origins and pre-history of American Indians tend to follow the thinking of our less conservative anthropologists (to this reviewer's liking); some of the others may pick at him. It may be supposed, however, that in knowledge of the various fields of art – from architecture to porcupine quill weaving – he stands above challenge. Artist with a scholarly mind, trained through achievement and study both, he is fitted as we doubt many are for the task of presenting an analysis and summary of the whole vast, incredibly varied and complex world of native American Indian art and craft.

About half the book is termed Introduction; it outlines, besides origins, the cultural horizons on which a history of Indian art can be based, and the techniques and esthetics of this art in its perhaps astonishing range. This fascinating part shows that in varying degree including the superlative, in the space of two continents, and in time beyond our present knowledge of its limits, the heterogeneous human family collectively called the American Indian produced the following on the level of art: basketry, paper, textiles, feather-mosaic, quill embroidery, beadwork, sculpture and every kind of work in stone, jade-carving, woodcarving, ceramic and modeling in clay, painting, lacquerwork, architecture, and metalwork (in almost everything except iron). California's Pomo are not for the first time called the world's leading basketmakers; ancient Peruvian weaving used "every imaginable technique . . . and even some for which no names exist" – it takes half a page just to list the weaves. Intriguing as the technical aspects are, the esthetic and philosophical bases of Indian art are worthy of attention, reflecting as they do so much of Indian culture in its other aspects. The latter half of the book breaks down North America into Arctic, Northwest Coast, Far West, Southwest, Eastern Woodlands, and Plains regions for a more detailed survey. The text closes with an extensive bibliography.

The illustrations are incomparable, the photographs as well as Covarrubias' own drawings and paintings. Of these last it should be said that the artist-author properly does not go beyond the accurate and telling portrayal of the work of his fellow artists and craftsmen; he is not displaying his own craft, unsurpassed for the job as it is.

Here then is a book that in content, in beauty of format, and excellence of production from typography to binding, well deserves its recognition as one of the few top-ranking books of 1954.

Of maize and men

Red Man's America: *A History of Indians in the United States.* By Ruth Murray Underhill. Illustrations by Marianne Stoller. The University of Chicago Press. 1953. x + 400 pp., 53 line plates, 13 maps. $5.50.

Indians of the Plains. By Robert H. Lowie. Anthropological Handbook Number One published for The American Museum of Natural History. McGraw-Hill Book Company, Inc., New York. 1954. xiii + 222 pp., 105 line drawings, photos, maps. $4.75.

The Indian Wars of the West. By Paul I. Wellman. Doubleday & Company, Inc., Garden City, New York. 1954. 484 pp., 52 photographs, 5 maps. $5.00.

Indian Corn in Old America. By Paul Weatherwax. The Macmillan Company, New York. 1954. vii + 253 pp., more than 60 drawings, photos, and maps. $7.50.

The attitude of the white man towards the red has passed in a lifetime through several significant stages. From about the Civil War to turn of the century and the defeat of the Apaches, a "good Injun" was a "dead Injun." Like the bison he was obstructing the course of empire. Finally herded – like the bison remnant – onto reservations, he was supposed to get decently extinct. Ethnologists rushed to measure his emaciated body and collect and catalog his remaining artifacts while he still breathed. A few small tribes died, but mostly the Indian displayed a healthy American intention to survive – some to acculturate as rapidly as opportunity permitted, others to keep their culture as nearly intact as possible. The new attitude is, let's appreciate the Indian for what he is and help him preserve his culture, even if we have to teach it to him.

There is fortunately no end to the stream of books about the Indian, the story will never be all told. In her big, attractive **Red Man's America** Dr. Underhill draws from a lifetime in anthropology and the Indian Service to make a general account of the Indian, his long history and his ways of life, intensely interesting just to read as well as sufficiently detailed and documented to be a useful source book. Another anthropologist, Robert H. Lowie, has done a detailed account of the material and social culture of the **Indians of the Plains,** the sturdily independent Blackfoot, Cheyenne, Arapaho, Dakota (Sioux), and others, among them the stoutest obstructors of westward expansion. If these are the noble redmen who have set the popular stereotype of Indian on our culture, their own highly specialized culture was one of the least known and understood. Dr. Lowie's book is to dispel ignorance and misunderstanding. There is far more to know about them than their ancient affinity with the bison.

Two earlier books by Paul I. Wellman, *Death on the Prairie* (1934) and *Death in the Desert* (1935) were combined and published as one, *Death on Horseback* (1947), which is now reissued as **Indian Wars of the West** to take its permanent place in our historical literature. This is the story of Plains Indian resistance to extermination from the Minnesota massacre of 1862 to the Little Big Horn and beyond. And it is the story of Mangus Colorado, Cochise, Geronimo, and their Apache bands. It is a story of men who preferred freedom to life.

One of the most fascinating – not only to scientists – problems connected with the Indian is the origin of his chief staple, maize. Dr. Paul Weatherwax, one of the most distinguished scholars to have tackled the problem, draws from historical accounts, archeology, genetics, botany, and other sciences to sum up in **Indian Corn in Old America** what we know – and what we don't know – on our way to possible future solution of the mystery. If you read Edgar Anderson's stimulating *Plants, Man and Life* you will enjoy, also, other views and a different approach. *Indian Corn* tells in full detail how the Indian grew corn, how he improved it and used it. An understanding of the culture of corn is basic to the understanding of the Indian's whole culture and life. D.G.K.

Those goblins again

EDITOR, *Pacific Discovery:*

I am enclosing a copy of the October-December 1954 *National Parks Magazine*, containing an article (p. 57) on Goblin Valley in Emery County, Utah, written for the purpose of stimulating public interest in efforts being made to have this outstanding area protected as a national park or monument, and hope we can count on your support. The enclosed pictures will give some idea of the extraordinary character of this wind sculptured wonderland, consisting of countless thousands of weird and grotesque figures of great scenic and scientific value. . . . In some correspondence with the U. S. National Park Service in 1953, they reported in part as follows:

In the fall of 1951, this Service made a field study of the Valley of the Goblins and the resultant report concluded that the area had scientific attributes worthy of protection as a public park or monument. We agree with you that the Valley is of outstanding interest and is worthy of adequate protection. We are glad you took the trouble to write to us about it.

The Park Service as you know appreciates any supporting views addressed to them on such subjects, as it is largely by such means that they accumulate the necessary evidence of public interest in preserving our National Heritage. They should be addressed as follows:

Mr. Conrad L. Wirth, Director
National Park Service
Department of the Interior
Washington 25, D.C.

It is equally helpful to let our Western representatives in Congress know of this interest, for they will have much to say about what is eventually done and it is desirable to gain their support for the efforts being made to save "Goblin Valley" from the ultimate fate of all such places when left without supervision.

Your organization of course is entirely familiar with the wanton acts of vandalism going on all over the country and one has only to refer to . . . newspaper editorials, . . . or such articles as the "Great American Litter Bug" in the May 1952 *Natural History* or "Rape of an Empire" in the October-December 1953 *National Parks Magazine* to realize the extent of this national disgrace. The problem is one affecting us all and is mentioned to emphasize the great need for prompt action to protect Goblin Valley before too late. As it is, there are not enough unspoiled protected sections of the country available to the public which is sadly in need of that kind of mental uplift.

Naturally it is not essential that anyone writing the Park Service or their representative in Congress, should have visited the area in order to express their views on the subject of protecting this or any other worthwhile place of marked scenic and scientific value. It is just a matter of sympathy with the purpose and aims of such efforts. . . .

P. W. TOMPKINS

San Francisco, 25 January 1955.

We regret there is no space to show Mr. Tompkins' fine photos of Goblin Valley, especially as his were the first to reveal its wonders to the outside world. We refer you, however, to the article in PD *March-April 1953, "In the Land of the Goblins" by Joyce Rockwood Muench, with photos by Josef Muench.*—ED.

Tahquitz haunts us

EDITOR, *Pacific Discovery:*

It was a pleasure indeed to open the last number of *Pacific Discovery* and find an article on Mt. San Jacinto, "To the Haunts of Tahquitz" by Marvin Weese. As a child I lived at the foot of that wonderful mountain, in the town by the same name, and have hiked numerous times to Tahquitz and San Jacinto peaks.

However, my pleasure turned to amazement when I read through the first paragraph on page 20 where the author discusses limber and lodgepole pines. The last sentence in that paragraph contains two misstatements. The opening phrase of the sentence "Both are silver-barked" is hardly true but I passed it by thinking that maybe the author has a different conception of "silver-bark" than I have. The next phrase, however, in which he states that both of these pines are "considered by some botanists to be one species," can not be passed by without some comment. I am most curious to know who Author Weese's "some botanists" are. Certainly the botanists at the California Academy of Sciences do not fall into this category. Furthermore, I know most of the botanists in California and I cannot imagine who of them would consider these two unrelated, native pines "to be one species." I wonder what Author Weese's conception of a species is.

Botany Department — ELIZABETH MCCLINTOCK
California Academy of Sciences
7 February 1955.

The editor is at least as much to blame as Marvin Weese for getting PD *lost in the pine woods. When copy was being edited, some mental microfilm reference to possible sub-*

(Continued from page 14)

the strata and the mountain slope dip in the same direction toward the observer, the strata at a steeper angle than the mountain slope, as is well displayed in the upper right corner. On the slope the sawteeth or "flat-irons" reach immense proportions and are fewer. They are arranged in five tiers. Adjoining the creek is a first tier of small thin flat-irons, dark gray in the photo, with indefinite or roundish points. Behind them follow the six sharp teeth cut from a package of strata in which about eight are very resistant. Behind them follow three high flat-irons, light gray, the two on the left ending in double "teeth." Behind them follow the three black teeth carved from a relatively thin layer of inferior resistance. In the upper left appears the largest tooth from the back of which all the lower ones between the two main gullies have been carved.

A note from the photographer, arriving at press time, says: "The Marble Canyon pictures were made in late afternoon light, from about 500 feet above the ground, looking almost straight down. The Mexican Hat picture is an oblique from about 1,500 feet."—ED.

specific relationship between two such pines seemed to obfuscate the editorial eye. If such a reference exists, subsequent checking has not brought it to light. Now it appears there may have been some confusion with respect to the recognized beach pine - lodgepole pine relationship. Jepson gives beach pine as Pinus contorta *and lodgepole or tamrac as* P. contorta *var.* murrayana. *McMinn and Maino cite the latter as a synonym, but prefer to give* murrayana *species rank in its own right. Whatever the source of confusion, Marvin Weese should be absolved of ultimate culpability despite his manful shouldering of it in the following note. (Incidentally, we are delighted at the evidence of a one-big-happy-family spirit developing among our authors. They are among our frankest critics.)*—ED.

EDITOR, *Pacific Discovery*

Somewhere along the trail that first paragraph on page 20 of the January-February *PD* got twisted and I don't know just where because I consulted several people about those pines. My original notes say it is the *lodgepole pine* that is adaptable on the exposed ridges and becomes twisted and contorted so that the specimens are sometimes mistaken for limber pines. I must have been confused after that and the use of the word "botanists" was a slip [*for which the editor is responsible.*—ED.] The bark of limber pine should be *brown* but in that high area they all seem to be a bleached gray.

Will you show this to Curator McClintock and let her know I am sorry. Perhaps she can put me straight on how these pines are like and unlike. Also she probably knows about white-bark pines. Some say they are on San Jacinto and some say they are not. [*Miss McClintock says that she does not know of* Pinus albicaulis *occurring naturally south of the southern Sierra Nevada.*—ED.]

Weldon Heald does a very consistent job (in conservation) and I only hope to help a little so that people will have more interest and reverence for our natural heritage.

Blackford's woodpecker pictures were great!

MARVIN WEESE

Sierra Madre, California, 18 February 1955.

MR. MARVIN WEESE
% Pacific Discovery

I just want to tell you how much I enjoyed your "To the Haunts of Tahquitz" in the January-February issue. Val Samuelson's fine photos, too, make me homesick for that rare sky country around San Jacinto that I used to know so well. Although I have gotten to like even better our lush, heavily forested mountains down here in southeastern Arizona, for over twenty years I rambled and climbed almost every peak in southern California and it is still home to me. Let's hope we can save what's left of them for the enjoyment and inspiration of those who come after us.

WELDON F. HEALD

Portal, Arizona, 29 January 1955.

EDITOR, *Pacific Discovery*

Please accept enclosed map, so you will not have to send Marvin Weese from Sierra Madre to Mount San Jacinto away around via Los Angeles. Also may I compliment you on the January-February issue — it is alone worth a year's cost.

H. M. HALL

Los Angeles, 26 January 1955.

Thanks to Reader Hall for the excellent Automobile Club of Southern California maps of Los Angeles and vicinity, and for a pertinent lesson in geography of same. When we said in "PD's Authors' that "Marvin Weese has to cross Los Angeles to get to Mount San Jacinto," we may have been influenced by a persistent if somewhat exaggerated notion that to get from any one point in southern California to any other, a crossing of the L.A. city limits is unavoidable.—ED.

Spring garlands

EDITOR, *Pacific Discovery:*

Just a word of deep appreciation of the article "Mount San Jacinto — Tramway or Wilderness?" . . . My sweetheart and I spent so many happy outings over the years in the desert below the mountain, with excursions up into the hill country that we appreciate anything (about this area).

C. M. GOETHE

Sacramento, 3 February 1955.

EDITOR, *Pacific Discovery:*

For a long time I have been wishing to write and tell you what an exceptional publication *Pacific Discovery* has proven to be. I subscribe to approximately 20 conservation publications and of course the Sierra Club receives nearly all of them. I read them carefully and am particularly proud to have *Pacific Discovery* from Volume I, Number 1 to date.

In reviewing the field as a whole, I find that *Pacific Discovery* seems to have value and variety far above the average. I particularly like the fascinating variety of subjects covered and the amount of good conservation material that is covered so consistently. Every issue is read cover to cover and then becomes a valuable file of accurate information for the future.

RICHARD M. LEONARD, *President*

Sierra Club, San Francisco, 2 February 1955.

EDITOR, *Pacific Discovery*

Permit me to congratulate you again on the continued high standard of *Pacific Discovery*. It gives me a quiet afternoon of restful intellectual pleasure when it arrives.

EARLE G. LINSLEY

Oakland, 22 January 1955.

Back file: New Zealand Issue

EDITOR, *Pacific Discovery*

The July-August [special New Zealand] issue has just arrived, and I should like to congratulate you on an exceptional, handsome and informative (issue). It is a pleasure to look at so beautiful a piece of work, and the text is quite in keeping with it. You may be interested to know that we sand our copies of *Pacific Discovery* to the Geographische Gesellschaft in Vienna, a very old and distinguished institution but a very poor one. They are most grateful and enthusiastic.

J. B. JACKSON, *Editor, Landscape*

Santa Fe, New Mexico, 13 July 1954.

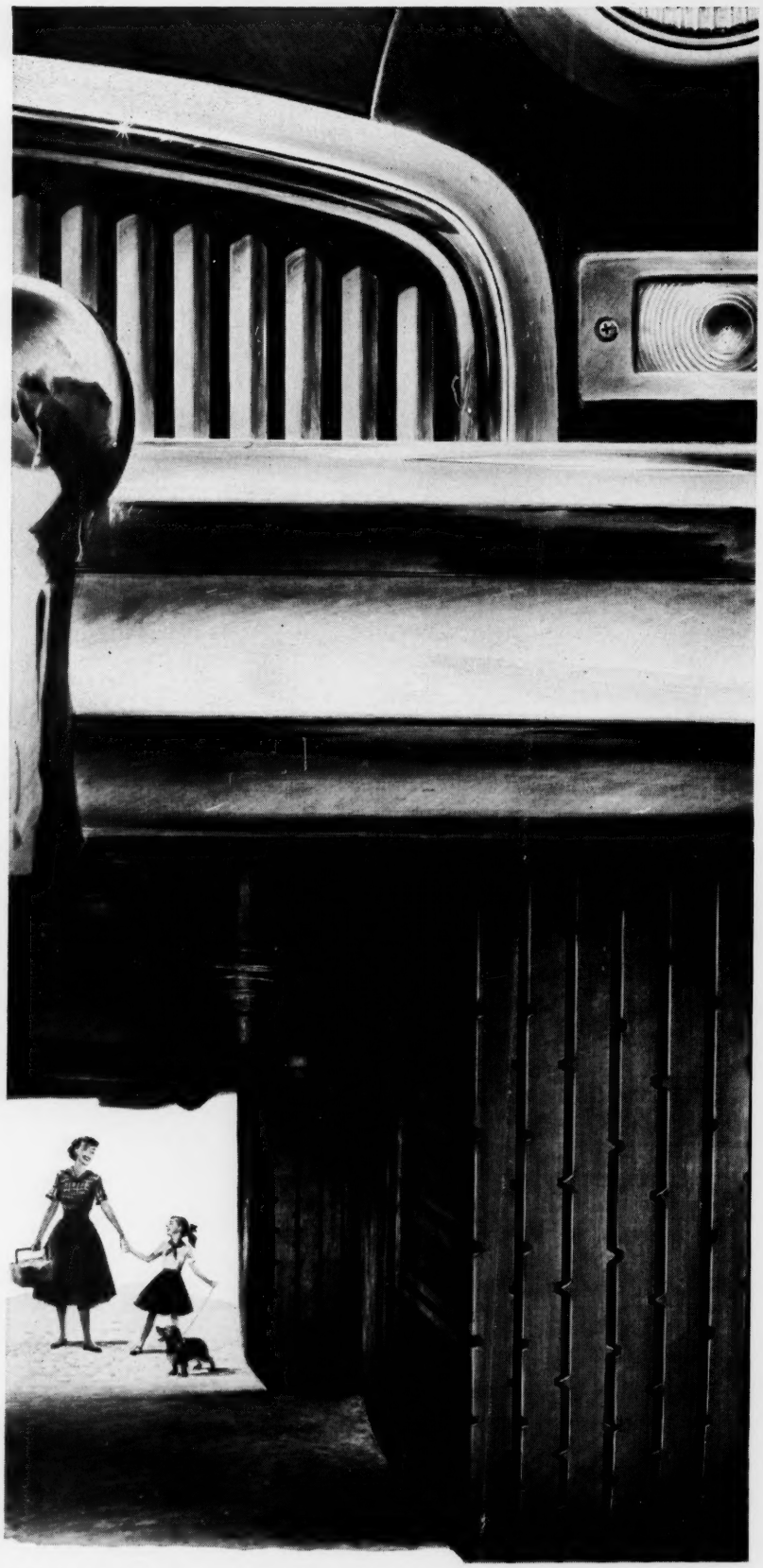
Our 125 "dry holes" last year helped keep you on wheels

If you're anything like the average motorist, you'll need about 690 gallons of gasoline to take you where you want to drive this year. And that's just a beginning. Keeping you on wheels and supplying you with the thousand and one "oil-born" products so vital to modern living requires 2 gallons of petroleum a day for every man, woman and child in the U.S. — an increase of 58% since 1941.

Helping to keep this oil flowing to you is Standard Oil Company of California's biggest, most expensive, least predictable job. In fact, we plan to invest $200 million during 1955 alone in exploring for new oil fields and developing existing ones, to help replace the petroleum you'll use.

Some 700 times during the year, Standard drillers will start bits spinning. As much as 16,000 feet of pipe may follow the bit before oil is found or the well is abandoned. Either way it's a costly hole: drilling an oil well may run anywhere from $125,000 to over $1 million. And every one is a risk—only 1 out of every 9 wells drilled in the United States in a promising but unproven area ever turns out to be an oil producer.

Yet new sources of oil must be found to keep our nation's abundant supplies from dwindling. Risking "dry holes" is the only way to find them. So the 125 "dry holes" we drilled last year are good evidence of the job Standard does to help keep you on wheels.



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